APRIL 4, 1983

IRON AGE

THE MAGAZINE FOR METAL PRODUCING MANAGEMENT

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A REVIVAL IN LACKAWANNA

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MORE NEW TECHNOLOGY, BUT DEMAND STILL SPUTTERS IN THE U.S.

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VOL. 226, NO. 10

IRON AGE

APRIL 4, 1983

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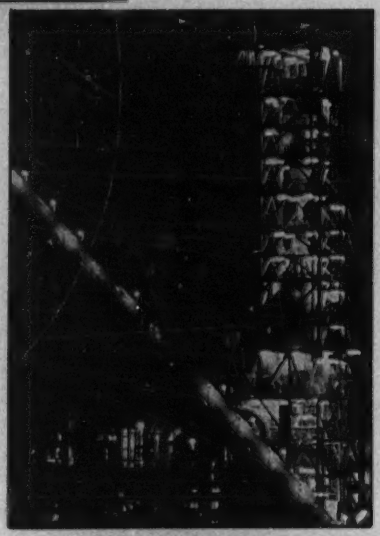

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Can high tech turn us around?

IRON AGE (ISSN 0164-5137) is published 36 times a year with a frequency of every 10 days appearing on a Monday-Wednesday-Friday cycle of every month by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc.. New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $55 one year. Canada, $65 year. Foreign, $65 one year. Single copies, $2.50. Cable Chilton, Philadelphia.
Send address changes to IRON AGE, P.O. Box 2040, Radnor, PA 19089

RECOVERY—

It's come. But many metalworking companies have seen few, if any, signs of it yet. The recovery will soon widen, but many question its staying power.

Along with spring this year has come business recovery.

Actually, it looks like the recovery may have started back when the snows of late winter were piling up.

By no means, however, is this recovery showing signs that it will 'jump out of the chute' as have most past recoveries.

The U.S. Commerce Dept. estimates that the U.S. economy grew at an annual rate of about 4 pct in the first quarter this year. And a number of top economists are looking for second quarter growth at close to that rate.

By way of comparison, the economy bounded out of the 1973-75 recession with annual rate jumps of 4.9 and 9.2 pct in the first two quarters of recovery. And in the first quarter of recovery following the 1969-70 recession, recovery leaped ahead at a 10.3 pct growth rate.

There is, however, one resemblance in the early stage of the current recovery to early stages of those in the past—it is impacting unevenly on the economy.

As one economist puts it, "Not everyone has yet been seated at the banquet table."

At this time, many in metalworking companies feel they are among those "not yet seated." That feeling is made clear in some of the individual industry probes made by *Iron Age* editors in the pages following this economic overview of the likely look of first half 1983.

Executives in a number of metalworking sectors still face long lines of idle equipment, trickling inflows of new orders and depressed earnings.

Playing the 'waiting game' is a role familiar to veteran metalworking industry executives, especially those in capital goods lines. It happens in every business recovery cycle.

Still, recovery seems clearly underway. It is rubber-legged and uncertain at this stage, but moving ahead. Like most recoveries in their fledgling days, this one will likely follow the pattern of running, falling and getting back up. Typically, it can be expected there will be setbacks in some important economic indicators in the months just ahead.

The real doubts about the current recovery are centered in its likely staying power. The greatest threat to recovery longevity, it seems agreed, is the huge size of the Federal budget deficits—and the possible lack of will of political leaders to come to grip with them. The financing of these presently projected deficits, it is widely perceived, would lead to recovery-wrecking sky-high interest rates.

But first, what are the signs that a business recovery has started?

Perhaps the one great clear signal of recovery was the massive runoff of business inventories in the closing quarter of last year. In the biggest one-quarter inventory reduction in history, some $44 billion in stock was liquidated. And history shows that sharp inventory cutting is the classic 'starting gun' in any run towards business recovery. This time, the stock cutbacks sounded like a 'starting cannon.'

The inventory cutting, as might be guessed based on its magnitude, was widespread throughout industry. Notably, inventory/orders ratios in durable goods manufacturing have fallen steadily since November. (See chart.)

Another key sign of recovery is the recent turnaround in indus-

AT LAST

trial production. In the playbooks of some economists, the trough of a recession is signalled 'officially' when declines in industrial output comes to an end. In hindsight looks, they have found that such turns coincide closely with the timing of formally declared cyclical troughs.

This fall in output appears to have halted in November of last year. Production in the nation's factories, mines and utilities rose in each of the following three months.

Backing up the recovery in production was an increase in manufacturing plant capacity utilization for 3 straight months through February. This usage rate was up after declining in 15 out of the previous 17 months.

Another sign that spells recovery is the new life shown in key consumer markets. The talk among home builders is all about recovery—and even strong recovery. The near-10 pct rise in sales of single homes as the year started—to the highest level in 28 months—has been but one of several signs of recovery in housing. February housing starts were up 93 pct from the year-ago level.

There will be some setbacks; that is just the way housing is. But recovery signs are so sure and so strong that the National Assn. of Home Builders is forecasting a 30 pct rise this year over 1982 in sales of single homes.

There has been little mystery as to the 'why' behind the housing rally. It is pretty much the same reason as for autos. Interest rates have fallen. And that has been like the opening of floodgates for those big-ticket consumer markets.

Interest rates on mortgages last summer were running between 17 and 18 pct. Now, rates are down to 11 to 13 pct.

The implication for the recovery in the big gains in housing comes through with a bright neon glow. The builders' association now expects some $63 billion to be spent on construction of new homes in 1983.

A turning point in slowly-recovering auto sales was sparked by similar interest rate cooling. Things have been more favorable for auto sales since auto makers came up with their 11.9 pct financing rate lure.

Falling interest rates alone didn't turn the tide in consumer buying of houses and autos. Inflation cooled, too. Last year, for the first time since 1978, real income of U.S. wage earners was up.

The recovery signs in autos and housing are not likely to become gone-tomorrow spurts. Consumer spending, despite some recent softness in retail sales, has been getting stronger for some time. Total consumer expenditures rose by 4.8 pct at an annual rate in the closing quarter last year—more than double the average rate of increase for the three previous quarters.

Too, Federal income tax refunds, averaging nearly $700 each and numbered in the millions, have started to flow out to consumers. In addition, as of July 1, their income taxes will be cut 10 pct. The timing of these boosts to consumer spending power couldn't be better in giving a helping hand to the wobbly-knee recovery.

It is little wonder then that surveys these days are showing a more optimistic, more in-a-buying-mood consumer. Noted the Conference Board last month in announcing its latest consumer survey, "U.S. consumer confi-

New Orders, Durable Goods Industries
Billions of Dollars, Mo. Avgs.
Plant and Equipment Spending, Mfg.
Billions of Dollars, Seas. Adj. Annual Rates

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dence registered a solid gain . . . suggesting that 1983 could be a better year than many analysts have projected."

The board found its 5000 surveyed households, "significantly more optimistic."

Not to be overlooked in pinning the label 'recovery' on the economy is the string of five straight months rise in the composite leading economic indicators. Notably, the rise in January was the biggest in 33 years. Sure, this indicator may slip a month or two in coming months, but it still looks like a new trend has made a strong start.

Corporations as well as consumers are becoming stronger more quickly in the recovery environment than many had thought likely.

Analysts at Chase Manhattan Bank recently noted, "Corporate balance sheets have improved dramatically, so that any future gains in income can be used to finance new spending rather than pay off old debts."

That development, of course, speaks well for the recovery 'catching on' in the economy.

Lastly, it might be said that economic recovery worldwide both confirms and strengthens the U.S. recovery.

Noted the Conference Board in a recent analysis of the international economy, "The prolonged worldwide economic slump appears to be ending, with recovery underway in the world's 7 major industrial countries."

In February, the board found, that for the first time since August 1981, leading indicators grew in all 7 countries—U.S., France, United Kingdom, West Germany, Italy, Japan and Canada.

Summed up the board report, "Latest growth rates (in leading indicators) in the U.S. and the other six major countries spell economic recovery in any language. A U.S. recovery will boost prospects for many developing and developed countries. Similarly, a recovery in other nations will strengthen the upswing in the U.S."

The final arbiter in deciding just when the 1982 recession ended and recovery started will be the National Bureau of Economic Research (NBER). This private sector group of top economists, which has long been the official referee on such matters, will wait some time before making its decision on the timing point of the latest business cycle.

However, Martin S. Feldstein, just prior to recently being named chairman of the President's Council of Economic Advisers, was head of NBER. And last month he said he expected the economy to grow by "about 5 pct" from fourth quarter 1982 to the closing quarter this year.

That's recovery. After all, between the same periods of 1981 and 1982, there was negative growth of 1.1 pct.

Most metalworking industries will likely be lifted onto the recovery bandwagon by late in this quarter or sometime in the third. Even badly-lagging capital goods producers will likely see some light in the last half of the year.

When the U.S. Commerce Dept., in late January and February, asked some 8000 business executives about their plant and equipment spending plans for 1983, it was told they would cut them back by 3.8 pct from last year. That's after adjustment for inflation. And it would follow a real decline last year in plant outlays of 5.5 pct.

'The budget deficits are bigger, relatively, than the iceberg that sank the Titanic.'

The surveyed executives, however, said they would be moderately stepping up their plant spending during the last half of the year.

This is in line with a number of forecasts of capital spending analysts who see a second half turning up of the expenditures curve.

But 1983, as a whole, will likely end up with negative growth for these outlays. The plus figures are expected to come too late this year to make the year as a whole a plus one for investment growth.

A hopeful sign for plant spending: Capital appropriations of the 1000 largest manufacturing companies were up 12.5 pct in the closing quarter of last year, according to the survey report of the Conference Board released last month.

But even in making that announcement, the board noted that "the capital invesment outlook remains subdued for 1983."

Simply, executives find little reason to boost their capital spending. Many plants are idle, corporate earnings are weak. And real interest rates on long-term bonds—a prime source of plant spending funds—are at all-time record high levels.

Even though the overall U.S. economy appears to be in a recovery stage at this time, there are probably more non-believers around than during any economic transition period in many years. Reservations and caveats about recovery fill the air. Sums up one analyst, "The staying power of this recovery is highly suspect."

There's good reason for all the crossed fingers and bet-hedging.

The U.S. economy has been on a stop-go roller-coaster for a long time now. A result is that output of the economy is less today, in inflation-adjusted terms, than it was back in the third quarter of 1979. More than that, 7 of the last 10 years have been marked by sub-par economic growth—with four of those years actually showing negative growth.

To top all that off, the last recovery (1980-81) was the **shortest** since 1921; the last recession (1982-83), the **longest** since the 1930's.

This time around, on the recovery side, there are great worries about the biggest Federal budget deficits in history. "Bigger relatively," says one economist, "than the iceberg that sank the Titanic."

Too, the international financial situation is shaky. The quote of the late President John F. Kennedy is heard often these days in way of reminder, "The only two things I really fear are nuclear war and an international financial collapse."

But, overwhelmingly, the huge budget deficits are seen as the great black cloud hanging over the recovery.

The Federal government is already vacuuming up about one-half of the nation's available credit—and the borrowing to finance upcoming $200 billion-plus deficits hasn't even yet started. Nor has the demand for credit by the private sector yet started to swell mightily—as it certainly will as business improves.

If this big-deficit scenario is played out, then interest rates could go through the roof. And in the minds of many executives and economists, that would mean curtains for the struggling recovery.

They see all this happening if the Federal government doesn't do something soon, and in a big way, about trimming these deficits.

Still, the fears are just that—fears only—and focus on the future. The recovery seems real enough and is here now.

So, in putting facts ahead of fears, it can be said that the outlook for U.S. business over the span of the next two or three quarters looks good.

John Baxter

Steel

The steel industry turned the corner in the first quarter of 1983.

After declining for six straight quarters, steel shipments in the first three months of this year rose to 15 million tons.

A further gain to about 19 million tons is indicated for the second quarter. The outlook is a little cloudy because it isn't known how much orders placed in January and February were influenced by price increases and uncertainty about the labor situation.

However, it appears that the steel market has had about one-third of a recovery. Steel shipments averaged 5 million tons a month in 1982 and fell as low as 4 million tons a month in the second half. Shipments are now running at the rate of 6 million tons a month. In a reasonably good year, the steel industry should ship 8 million tons a month.

With business showing some improvement, steel labor costs have gone down for the first time in recent history. The contract signed March 1 will reduce compensation about $1.50 an hour. If this is combined with a real surge in volume, the effect would be dramatic. So far, there is no sign of such a surge.

The recovery is based on a slowing of inventory cuts and better business in consumer markets. The auto industry is selling and building a few more cars. The rise in housing starts has boosted appliance activity.

Sheet products have gotten a big lift from the auto industry. By March, producers of galvanized sheet were scheduling 20-turn operations. There has been a sharp rise in orders for stainless flat rolled.

The inventory situation is mixed. In auto-related areas, steel stocks have probably been stabilized. In the oil country market, it will probably take another 9 to 12 months to run off surplus pipe and tube inventories.

Still to be heard from is the capital goods sector. Things are still dead for farm equipment, construction equipment, freight cars and machinery. It's expected the lag will continue until some real strength emanates from the auto industry.

The general view is that capital spending will revive in the second half. That has to happen if steel shipments are to reach the modest targets projected for 1983. In the first half, the industry will ship 35 million tons or less.

With the auto model slowdown and other factors, the second half of the steel year is normally worse than the first half. The assumption in 1983 is that the capital goods recovery will override the seasonal effect and the second half will see rising demand.

If that doesn't happen, the year will fall short of the 72 million tons predicted.

Volume is obviously the key to steel solvency. The industry shipped 60 million tons last year and lost over $3 billion. Assuming the new labor contract reduced compensation $1.50 an hour, the same volume would leave the industry still in the red—to the tune of $2 billion.

Each added ton would help, both by increasing the labor cost saving and by helping to firm up prices. The mills increased their published prices for sheets and bars in February. It will take considerably more demand for the industry to be able to collect the published prices.

One source of happiness for domestic mills is the apparent easing of steel imports. For the last two months reported, only a little over 1 million tons of steel were imported. That compared with nearly 2 million tons a month in peak 1982 months.

This could be just a temporary lull. January imports reflected orders placed in late 1982 when demand was at a low point. The closing of the St. Lawrence Seaway in the winter normally slows the foreign flow.

However, mill officials report a lessening of foreign competition for current business. That is true of carbon steel and also of stainless flat rolled. There are still problems in the weak stainless bar and wire markets.

There are good reasons for foreign producers to exercise restraint. Final action on specialty steel injury cases is due July 4. An import surge just prior to the decision would invite harsh restraint.

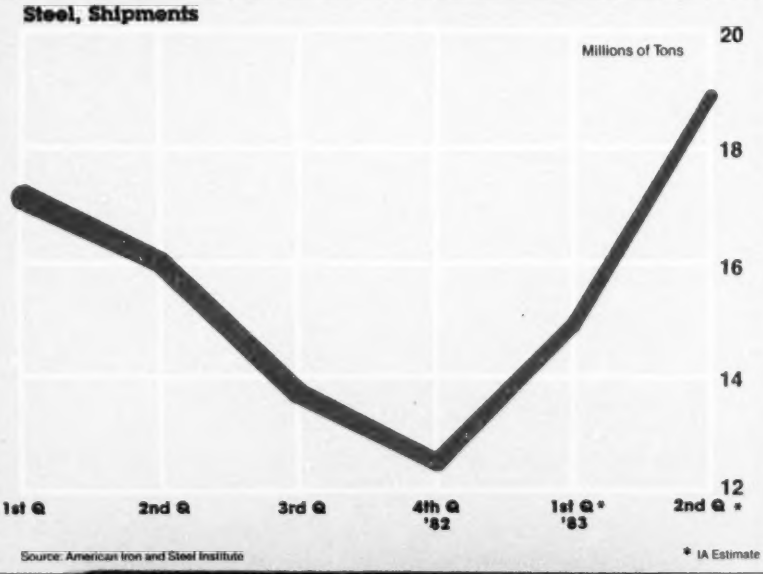
The specialty steel market is a state of delicate balance. Apart from the resolution of the import question, stainless producers are waiting to see how cost and price pressures will balance out. Demand for stainless sheet and strip has risen sharply. The mills are getting more business from flatware and appliance companies as well as from auto plants and service centers.

At the same time, prices of nickel, chromium, and scrap are going up. It remains to be seen if the stainless market is strong enough for these costs to be passed on. It also remains to be seen if the stainless order surge of recent months has some element of price "hedging" in it.

If the specialty import case brings limits on foreign shipments, that will take some of the pressure off stainless prices. It doesn't necessarily follow that these prices will go up. Stainless flat rolled prices were generally stable during the period of import quotas from 1976 to 1979.

Stainless bar producers face a grim prospect. There has been little or no improvement in their orders. It's unlikely that bar imports will be rolled back enough to relieve price pressure. And like sheet mills, the bar producers are being hit with rising raw material prices.

Steel, Shipments



Source: American Iron and Steel Institute

* IA Estimate

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Nonferrous

The begrudging nature of the economic recovery to date underscores projections by many nonferrous metals producers. Many of the industry's members put demand—and more importantly, consumption—on the comeback trail some time in the third or fourth quarter of 1983.

The freshet of favorable business developments, such as the upturn in housing and OPEC's retreat on published prices for oil, lent a firmer tone to market prices for aluminum, copper and nickel during the first quarter.

It was difficult to determine, however, how much of the buying reflected a better chewup rate. The upward price move either paused or turned a bit sour in mid-March for aluminum and copper.

Copper prices had risen roughly 15¢ a lb from depressed end-1982 levels despite a relentless increase in hedge market inventories before profit-taking set in. Increased housing starts, signs of improvement in the appliance sector, and the correction of downward drift in the automotive output and other parts of the economy contributed to the copper gains.

Price trends in the second quarter are likely to be determined by the drift of labor negotiations in the copper industry this spring. Current three-year contracts expire at mid-year and the usual pattern is a settlement following a lengthy strike. The producers emerged from the 1980 strike with a lot of lost production and sales that were difficult to make up as the economy slipped into the recession.

While copper producer stocks moved higher last year despite substantial production cuts by U.S. companies, consumers took their reduced requirements on a hand-to-mouth basis. How much consumer inventory rebuilding took place in the first quarter of this year during the price runup is hard to determine, but some producer sources said they didn't think it was significant. That could mean a busy second quarter for the copper producers, if the business recovery continues at even its current wary pace and soundings from the copper labor scene hint at another strike. The recent recession, plus less than robust first half prospects, haven't left much weight for copper labor or management to throw around, however.

A quickening of the pace of incoming orders for aluminum during February and early March has been tied, at least in part, to the upcoming wage bargaining sessions to replace the three-year pacts that run out May 31. Unlike copper, aluminum's record has been one of minimal work stoppages, particularly at the smelter level. The three major U.S. producers were unsuccessful in attempts to draw any concessions from labor late last year, however, and no one in the industry wants to predict how this year's negotiations will go. But, with profitability elusive through the first half and with a lot of capacity still idled, neither aluminum labor or management have much weight to throw around either.

Free market aluminum prices jumped about 33 pct to about 60¢ a lb by early March despite a steady runup in London Metal Exchange warehouse stocks. A lamb-like trend began developing by mid-month, with the spot price retreating toward 55¢ a lb. Some of the early strength reflected ingot buying by producers who found this approach more economical than restarting idle smelter capacity. Another advantage was that this helped dry up some of the surplus metal on the L.M.E. and the merchant market generally.

A lot of the L.M.E. stock was Eastbloc metal sold to raise foreign exchange after a protracted run of grain crop failures in Russia. The downtrend in oil prices reduces the Soviet Union's foreign exchange earning capacity from that source and raises the possibility that more aluminum, platinum, gold and nickel will have to be sold instead.

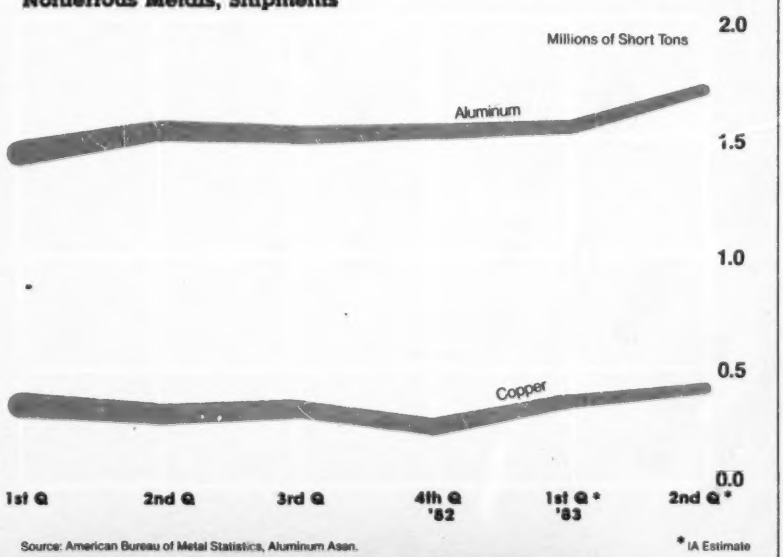
Like aluminum and copper, nickel prices have moved higher, mainly on the L.M.E., despite a steady rise in exchange warehouse stocks to about 25 million lbs, nearly double the stock at the start of the year. Industry sources said there has been some improvement in demand at the consumer level.

Some of the improved demand reflected a measure of improvement in the consumer goods sector and some reflected spotty inventory filling by nickel users. Producers have maintained a tight rein on production but, while consumers may be having some difficulty getting quick service on fair-sized spot purchases, the producers still are able to handle longer-term contract business easily.

The lead industry finished 1982 with a 5.1 pct gain in shipments on a poor 1981 showing. The winter of 1982-83 failed to produce the sort of weather that takes a heavy toll on automotive storage batteries and the producers' inventories were still on an uptrend as the first quarter began. Battery industry sources are looking for a shipment gain of from 3 to 4 pct this year on a poor 1982 showing. The price of lead wobbled a bit in the first quarter, but remains depressed.

The zinc industry sustained a drop of nearly 19 pct in shipments last year and shipments didn't exactly get off to a flying start in the first quarter of 1983. Lower production helped keep the zinc producers' inventories in check—as did last year's shift to the zinc penny—but real recovery won't come until domestic auto production and sales show more signs of life.

Nonferrous Metals, Shipments



Source: American Bureau of Metal Statistics, Aluminum Assn.

*IA Estimate

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QUARTERLY FORECAST

Auto

U.S. automakers expect to sell 1.6 million cars this quarter. That would be the strongest quarter since the third quarter of 1981.

U.S. automakers likely will produce 1.7 million cars in the second quarter of 1983, 200,000 more than the 1.5 million in the first quarter.

By contrast, U.S. car production in the second quarter of 1982 was 1.57 million; in the first quarter of 1982, 1.07 million.

Automakers expect sales to rise more in the third and fourth quarters of 1983. That could raise total sales of domestic cars in 1983 to 6.3 million, about the same as in 1981.

Who ever thought the automakers of 1983 would be happy to equal the sales of 1981 and would view the sales of 1980 (6.6 million domestic cars) as high? By contrast, automakers sold 8.3 million domestic and 2.3 million imported cars in 1979.

Many auto analysts doubt that U.S. sales of domestic and imported cars in any year will exceed 9 million in this decade. If so, the auto industry will *not* be the segment of the U.S. economy that leads a recovery.

Total U.S. car sales in 1980 were 9 million; in 1981, 8.5 million; and in 1982, 8 million. Total sales for 1983 likely will be 8.6 million, including 2.3 million imports.

Since 1979, import sales each year have been 2.3 million or 2.4 million. This is due mainly to the voluntary restraint by the Japanese.

"This year," says the sales analyst of one Big 3 automaker, "there's a 20 pct chance there will be a real recovery, with sales near the levels of 1979. There's a 30 pct chance of a modest recovery; but a 50 pct chance of the slogging improvement we've had since hitting the low point of 1.3 million domestic sales in the fourth quarter of 1981."

To be sure, the chairman of one Big 3 automaker expects the best: an annual rate of 14 million car and truck sales by the fourth quarter of 1983. That would equal the sales rate of 1979.

Sales in April and June 1983 likely will exceed those of April and June 1982. Sales in May 1983 will be higher than those of April 1983, but lower than those of May 1982.

At the end of March 1983, automakers plan to end their 11-pct financing programs. Sales will drop from March to April, as they did the same time last year, for the same reason.

Since automakers this year will maintain production levels, inventory will rise from a 58-day supply at the end of March to a 72-day supply at the end of April.

Sales and production likely will be about the same in May. In June, automakers may cut production to cut inventory to a 65-day supply.

Machine Tools

The United States machine tool industry began 1983 on a sorry note. January orders were 55 pct below that month a year before. Shipments were down 60 pct in January '83 from January '82.

And the industry's backlog continued to fall, also, which is bound to weaken this year's shipments.

The second quarter of 1983 may show a slight increase over the first, but still far below last year's figures.

And any real turn around is still far in the future. All the factors which made 1982 a bad year are still present. The recession continues, although some see indications of an upturn. U.S. industries are far away from being in a position to make substantial capital investments.

And foreign competition still looms as large a threat as ever.

There are some positive signs, however. Defense orders are beginning to be felt by the tool builders. And, with a strong defense budget will come more orders.

There is substantial growth predicted in the machine tool rebuilding market, just because of the age of the current machine tool population. If there is no capital for new machinery, the old must be upgraded.

It is possible to take an old machine tool, add new controls and new hydraulics and bring it up to the performance level of a new tool—for a fraction of the price of a new machine. Machine tool prices remain high, even now, when price cutting is taking place.

Some distributors see a good order recovery in about five or six months, however some of this recovery will be in foreign tool purchases. U.S. builders will feel this recovery after the "burn-off" of foreign backlogs.

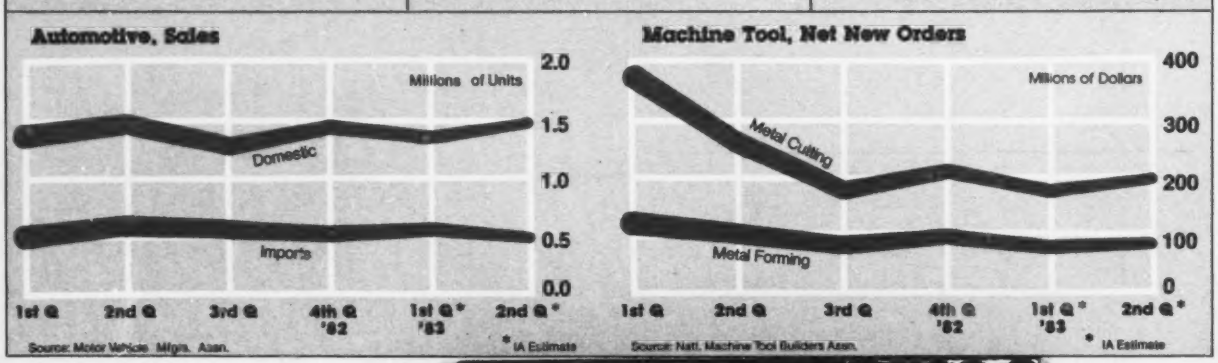
One source believes U.S. builders will see some good order performance in the fourth quarter of this year.

Another positive note comes from a major financial institution which deals in financing machine tool purchases. "Business is increasing rapidly," says this source. And interest is strong both for new equipment purchases, but also for plant expansion.

And, of the orders being quoted and inquiries being received, most include computer numerical control, an indication that the buying companies recognize that automation is the only way to compete.

The export market in machine tools is dominated by the Japanese. U.S. exports weakened in 1982 because of a slump in worldwide economies and the relative strength of the dollar. Exports will continue to weaken.

Mergers and acquisitions will save some smaller companies from extinction and hopefully build stronger, healthier, more competitive companies.



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QUARTERLY FORECAST

Instruments & Controls

Instrumentation and control industries had a poor 1982, and the beginning of 1983 hasn't been great either.

The causes are the same as they have been for so long—the recession has all but halted capital spending and these industries depend heavily on capital spending.

These industries generally lag an economic recovery by six months. Therefore, even though 1983 is expected to be a better year, recovery for these industries will be later than for some others.

Still, there is some optimism. Many controls builders experienced strong inquiry levels throughout 1982, particularly toward the end of the year. These builders feel that buying decisions have been made and are just waiting for the proper economic climate, which should be along shortly.

Some even feel that 1983 will be stronger than predicted, up by more than the 2.5 pct growth in shipments that the Department of Commerce predicts.

It is not surprising that the first segments of the industries to feel increased order activity are those offering smaller, lower priced, stand-alone types of equipment.

Instruments that incorporate electronic technology likewise have been stronger, since they are perceived as contributing to efficiency, productivity and safety.

Measuring and control instruments are the most pertinent to the metalworking industries. Within this sector, industrial process control instruments are the largest. This group has shown the most growth during the last decade.

Sales for these instrument makers grew by 2.7 pct in 1982 and will hold at that rate for the year 1983.

Many modernization programs, which would involve a significant amount of control equipment, have been postponed because of the economy.

With the delay, many of these facilities may never reopen.

Regardless of the timing of the upturn, however, demand for some instruments and controls grow faster than the rest of the economy, particularly products which can reduce energy consumption or improve efficiency without a large capital outlay.

In the manufacturing area, the emphasis is heavily on automation and integration. The so-called factory of the future has created a strong market for communications equipment and for sensors, transducers and transmitters, as well as such control equipment as programmable controllers. Numerical controls, however, are still in a slump, waiting for the machine tool industry to recover.

In general, the first half of 1983 will show some modest improvement. But the second half may be better than was thought—not up to the growth of previous years, but better than the past two.

Computers

Moderate growth marks the domestic computer industry throughout this quarter. The industry began an early recovery from the recession late last year and the upturn continues, however slight. With this continued growth, the industry should finish out 1983 with shipments up almost 18 pct (in 1972 dollars), according to the Dept. of Commerce.

Throughout the recession, certain market segments remained strong. Specifically, personal computers continued a strong growth curve, CAD/CAM's growth stayed above the 30 pct range, and the superminicomputers still felt demand. These types of equipment should be even stronger as the economy strengthens.

Clearly, manufacturing is one of the strongest potential marketplaces for computing equipment of all types. The mainframe computers, although not growing as fast as their minicomputer cousins, are still required to perform the data management and number crunching tasks which manufacturing companies need more and more as they strive to integrate operations.

Minicomputers, particularly the 32-bit variety will be required to take on CAD/CAM activities, production control, perhaps cell control as implementation of manufacturing cells begin.

And microcomputers are and will continue to be found everywhere—behind every control panel and inside every machine. As recovery strengthens, and more capital is freed for investment by computer buyers and product development by machinery builders, the inroads of the microprocessor will be even more dramatic.

"Assuming moderate recoveries in the U.S. and European economies in 1983, computer industry shipments should increase by about 18 pct, after adjusting for inflation. Exports will increase 20 pct," according to government economists.

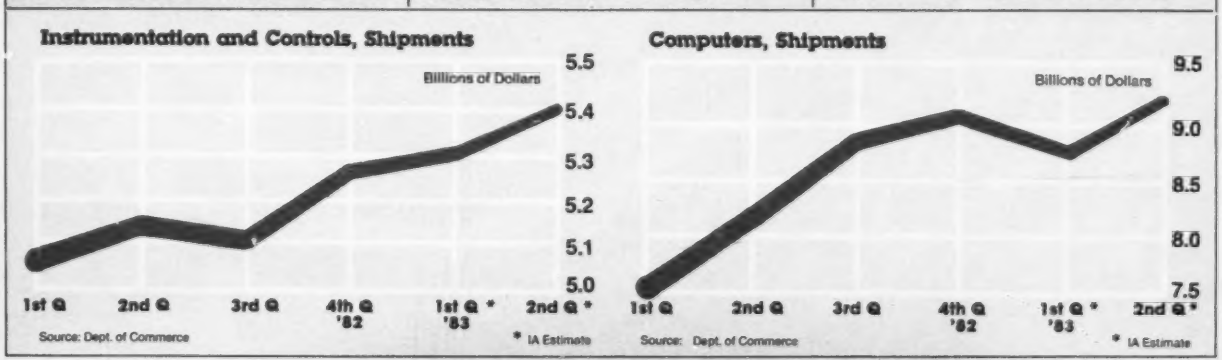
Exports rose only 4.5 pct in 1982, because the European economies were not strong. But imports to this country increased 30 pct.

The slight increase in computer exports and the substantial growth in imports narrowed the U.S. computer trade surplus to $6.7 billion during 1982.

There is a lot of talk about the Japanese competition in the computer industry. How big it is? When it will begin?

Some early inroads have been made in peripheral equipment. And, of course, memory chips are a well known story.

But, with talk of a Japanese super computer and a "fifth-generation" computer effort underway in Japan, some feel that the U.S. builders of computers will soon feel the weight of competition from that country that has so impacted other domestic industries.



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QUARTERLY FORECAST

Metal Coatings

Shipments of industrial product coating materials finished 1982 as had been expected—on the down side. The last quarter of 1982 ended about 7 pct below the same quarter of the previous year and more than 11 pct from the third quarter.

Producers still feel the impact of the slowdown in the heavy paint consuming industries—particularly automotive, housing, farm equipment and earthmoving equipment. Generally, coating material consumption closely parallels the trends in manufactured products.

Therefore, the outlook is beginning to register a glimmer of hope for the remainder of 1983—but only a glimmer. Any upturn in shipments is expected to be slight.

The latest statistics from the producers of coil-coated steel and aluminum are also discouraging in that registered declines in shipments ran between 13 pct and 15 pct. This latest decline reversed an upward trend that the industry had been enjoying, but briefly. The slowdowns in transportation and building products—the two largest consuming industries for coil-coated products—were largely responsible for the decline.

The one bright spot for coil coaters has been in the area of weldable zinc-rich primers which has held its own throughout the recession. But, unfortunately, the same cannot be said for the use of coil-coated products for rural buildings, pre-engineered buildings and appliances. Other major uses, such as those for residential siding, roofing and mobile homes have also declined.

Another area showing promise and holding up well at present is the can and container industry where pre-coated aluminum shipments had been faring well. Coil-coated steel for cans, ends and tabs has also increased in usage recently.

Plastics

Sales and captive uses of plastics resins slipped by about 5 pct in 1982 as compared to 1981. However, the last two quarters of the year were slightly above the same two quarters of the previous year—but only slightly. The final figures for the year show usage for 1982 amounted to some 32.2 billion lbs as compared to 33.9 billion lbs for the previous year.

This annual decline is only the third in a quarter century for the plastics industry.

As some large markets for plastic resins begin to turn around, the plastics industry, too, should rebound—but slowly. Average annual gains of from 10 to 12 pct have been commonplace, but the short-term outlook, through 1983, is expected to be much smaller.

The reinforced plastics/composites segment of the industry had expected a modest gain for 1982, but the year ended on a low note. As the new year started, there was considerable doubt as to whether 1983 would show a turnaround. Some producers reported new orders, but as one industry spokesman put it, "Most were still sitting on their hands."

Within the past month or so, there's a feeling within the industry that "things are beginning to move." They attribute low inventories in many cases as the reason for a ray of hope.

But generally, the feelings are mixed. Some believe that there will be some rebounding from a depressed '82, but the sales will not regain last year's losses. Others—more optimistic—feel that the estimate for '83 has been conservative.

Of the major classes of plastic resins, only high-density polyethylene and thermoplastic polyester have shown modest gains in sales. Others posted declines, some significant—most notably the styrenes.

Fluid Power

Fluid power began to move up a little in the opening month of 1983. The industry is still sitting on its own forecasts, holding them down even though the first half of any calendar year is when the majority of fluid power companies have historically had their strongest business period.

Twice-burned is twice cautious. In 1981, the industry thought it might be recovering, it did not. And, in 1982, while acknowledging things were starting at a slow pace, they expected a strong second half. That did not happen either.

Forecasts are low. Not only for the first quarter but for the second quarter as well. One of the biggest holes in the market prospect is still the mobile equipment market.

While the truck market looks improved, the farm machine and construction machinery markets are still weak enough to discourage all but the hardiest of optimists.

There was an upward blip in the first figures reported for 1983 by the National Fluid Power Association, which has been conservative in its own appraisals of 1983.

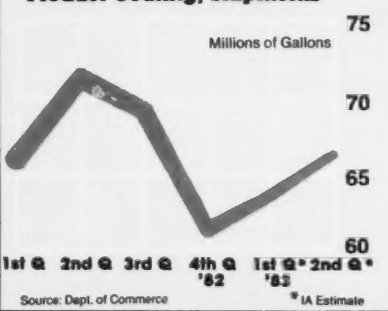
The first reports from 1983 orders suggest that both hydraulics and pneumatics shared in the increase. By one estimate, January orders were running 30 pct of the December period. That sounds better than it really was.

December looks like it was the worst month of the year for pneumatic orders. Hydraulics might have been signalling a slight recovery in December.

However, companies in both pneumatics and hydraulics have reported some December gains.

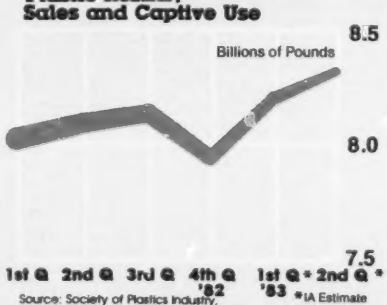
Fluid power companies believe there will be slight gains in second quarter over first, and a dramatic pickup won't hit till the third quarter and maybe not even until the fourth.

Product Coating, Shipments



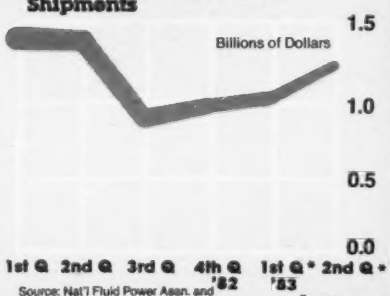
Source: Dept. of Commerce
*IA Estimate

Plastic Resins, Sales and Captive Use



Source: Society of Plastics Industry, Committee on Resin Statistics as compiled by Ernst & Whinney
*IA Estimate

Fluid Power Equipment, Shipments



Source: Nat'l Fluid Power Assn. and Dept. of Commerce
*IA Estimate

QUARTERLY FORECAST

Construction

There's a mild wave of hope in the ranks of construction machinery builders. Since January, there have been a few signs that the worst is over, that contractors and home builders are beginning to crawl up out of the trenches and advance again.

One of the first rays of fresh hope came from CIT Corp., the big financial company, which has been polling contractor opinion for the last seven years. (It accurately predicted the deep slump of 1982, at a time when many still expected 1982 to show a strong second half.) This time, CIT's poll finds contractors expecting a recovery in 1983, by a surprisingly strong majority.

But marketing and manufacturing managers out in the construction machinery plants are also sounding a little more ready to bet on increased sales in 1983—even if the increase is minor.

Partly this is due to some new legislation. Anticipation of the increase in the gasoline tax to fund more highway rebuilding began to kick up some equipment orders in the roadbuilding group as January.

Another surprising development: Marketing managers, who see only slow gains this year (or none) in factory sales of construction machinery, are sitting on some plant and production managers who want to manufacture more equipment. So far, this minor battle hasn't been resolved. A few have made minor upward production adjustments, but they are still a minority.

And with the industry leader, Caterpillar Tractor, still strike-bound in March, these slight gains at other companies haven't produced much new business for their vendors.

One other positive note: For the first time in a year, prices have begun to stabilize, despite the cut-rate used equipment bulge.

Farm

If any industry in the U.S. is in worse shape than the construction machinery builders, it has to be farm equipment.

While press attention has centered on Massey Ferguson and International Harvester and their battle to reduce debt, the entire farm equipment industry has survived a sales drought that last year pulled tractor sales down 32 pct and a crushing 44 pct decline in self-propelled combines. These are the two biggest dollar items the farm machine industry produces.

The industry has a long way to come back. The first hint that it might was the 31 pct increase in combine sales this past January. Nevertheless, tractors are still off, and most equipment is still badly down at the retail sales level. There's a tendency to play down that combine sales surge, however, as a move by a few big companies to get their combine inventory down with price cuts.

The first reports of the impact of the "Payment-In-Kind" program said that this would also hurt farm machine builders on the short run. If a farmer can get grain from government reserves, he doesn't need to grow his own. So, he won't need new equipment.

Now, there's a little more positive side to the PIK idea, however. Marketers argue that a farmer buys machinery on cash flow.

If he gets money, whether selling PIK grain or his own grain, he's more apt to look for new, more efficient machinery.

As in construction machinery, an argument is developing between plant production teams and the market analysts. The production managers say plant inventories are getting low. Marketers want production kept on hold, because they believe the industry faces two lean sales quarters ahead.

Mining Equipment

"Right now, I don't really much care about the national debt. And, personally I don't much care about El Salvador either," says one coal industry equipment supplier. "What I care about is the coal mining industry and, as everyone knows, the country got off easy this year as far as weather is concerned. We don't like deficit financing in Washington in this business. But a warm winter is even worse for us," he adds.

Others expect a lukewarm recovery in mining throughout the country as the year moves along. "Our business is the energy business," the executive continues. "If industry is down and temperatures are mild we just stare at the walls," he says.

"Last year was one of the poorest we ever had. This year is a mystery. If I was forced to predict, I'd say the first half of '83 will be just like the last half of '82. In other words, zero," says another industry source. The second half: "Some people in the business expect a real turnaround in coal, mainly because of a business recovery and a stalled nuclear program."

One new wrinkle for mining equipment makers is what nearly everyone outside of the oil industry is cheering about.

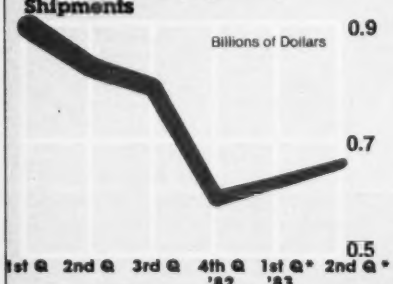
"Oil prices are in a free fall. To you that's great. To us it might mean the same thing as a mild winter," says one large coal mining equipment company vice president.

Just what the terrific drop in oil prices might mean to coal mining in the U.S. is a mystery indeed.

Meanwhile, other kinds of mining are doing little to keep spirits up in the equipment industry. "Iron ore? Worst year in living memory," says one expert in the business. This year? "Depends on steel. You tell me," he answers.

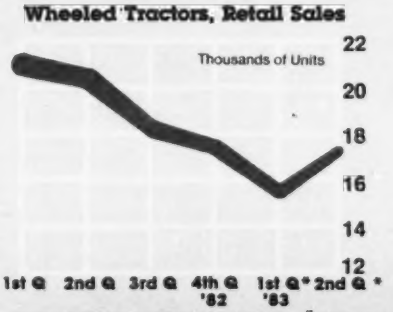
Copper mining? "About as hopeful as iron ore," says an expert.

Construction Equipment, Shipments



Source: Dept. of Commerce *IA Estimate

Wheeled Tractors, Retail Sales



Source: Farm and Industrial Equipment Institute *IA Estimate

Mining Equipment, Sales

Source: Mining Equipment Mfgrs. *IA Estimate

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QUARTERLY FORECAST

Material Handling

The material handling industry has been reporting very "good signals" from the marketplace for weeks. "We'd rather have orders," says one industry executive, "but the inquiries have been on the upswing for several weeks."

These "good signals" have been for large systems more than single items like industrial trucks, he adds. That means the larger companies are talking optimism seriously.

"We are very optimistic about '83, especially the first half," says an executive with one large material handling company.

"The marketplace seems to be convinced that what we make will be a good buy this year. We believe that '83 will show up as at least 25 pct better than '82 with most of that coming in the second half," he adds.

While the stacker/retrieval people are the most optimistic, even the manufacturers of more prosaic pieces of equipment are expressing some optimism. Says one lift truck maker: "What we make can be likened to a car. The buying cycle may have changed from three or four years to more, but that still means it's only a matter of time. We expect that time is fast coming up."

The consensus for first sales quarter? Not much above the last quarter of '82, perhaps up by 5 pct. The second quarter? Up perhaps by 8 pct over '82's second quarter. But, the last half of the year is where the hope lies. "For all of '83, we see an increase over '82 in this industry of 20 pct, but the last half will show almost all of the gains," says an analyst.

One further source of optimism for the warehouse systems is the lack, so far, of foreign competition in the domestic market. "You rarely import what they make," says the analyst. "It's just not practical, it's too custom."

Appliances

As housing sales increase, so does the optimism of the major appliance manufacturers. Sales of new single-family houses rose 9.9 pct in January over December figures, making the annual rate the highest in 28 months. In addition, existing-home sales were up significantly.

Along with the housing market, the appliance industry also has entered 1983 with a bang. January shipments of nearly 2.2 million major appliances surpassed January 1982 totals by 13.8 pct and December 1982 shipments by 15 pct. Making the strongest showing in recent weeks were refrigerators (up 31 pct in January), electric ranges, dishwashers, disposers and clothes washers.

"With gains in recent weeks, it looks like the appliance industry has definitely turned the corner in this recession," explains one industry spokesman.

Despite sales increases, spokesmen caution about being overly optimistic. Most suggest any industry growth that comes will be slow and steady. Recent figures look good only in comparison to some very poor months a year ago.

"Anything would look good next to last January, the worst one we ever had," comments one official.

Says one manufacturer, bad weather depressed sales last winter, making large sales increases this year suspect. However, he believes that the appliance industry is beginning its long-awaited recovery. Industry sources see appliance sales improving between 6 pct and 9 pct this year.

Although the industry expects the appliance replacement market to strengthen in 1983, it believes that increased home sales are the real key to recovery. The housing market began collapsing in 1979, hit bottom in 1981, and remained depressed through most of 1982.

Oil Country

Though other U.S. industries may show signs of a recovery in the second quarter, the oil country tubular goods (OCTG) industry will not be one of them. The outlook for OCTG producers and distributors is very pessimistic.

"I think the second quarter will be just as bad as the first one was," said a major pipe producer. "I see no reason to believe there will be any change. Most people are still selling out of inventory."

The producer further noted that he does not foresee any upturn in mill activity until the very end of the third quarter.

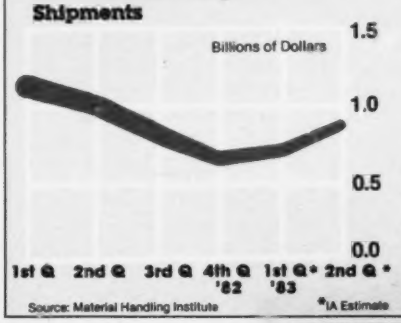
The outlook for OCTG distributors is equally as grim. "The market is deteriorating; it's not getting any better," said one pipe distributor. "The pressure on distributor prices is really bad; some are selling at 50 to 60 pct below list. People are really taking a bath. I see nothing encouraging for the second quarter," he noted.

Probably the biggest factor contributing to the depressed market is the surplus of OCTG inventory at nearly every level. It has been estimated that inventory on the ground ranges between 3.8 million and 4.3 million net tons, or about a 9½ months' supply. This combined with a U.S. rig utilization rate that was under 50 pct for the second week of March (the lowest since 1967) has reduced demand.

A major Houston-based oil company reports that it currently is doing "very little" buying of OCTG products. It noted that in the past few months it has sold millions of tons of its own OCTG inventory to "anybody" who would buy it, but it still has got "a whole lot left."

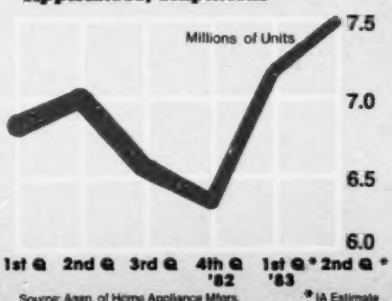
Also having a big impact on the industry has been the recent disarray among the Organization of Petroleum Exporting Countries over crude prices and production quotas.

Material Handling, Shipments



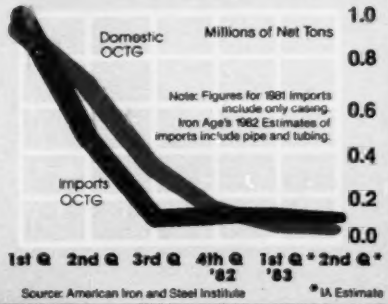
Source: Material Handling Institute *IA Estimate

Appliances, Shipments



Source: Assn. of Home Appliance Mfgrs. *IA Estimate

Tubular Goods, Shipments



Source: American Iron and Steel Institute *IA Estimate

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QUARTERLY FORECAST

Castings

The inching gains in foundry shipments are still being made.

Real movement, foundrymen believe, will not occur until the fourth quarter. Gray iron castings were showing a little better relative gain than ductile iron castings. Gray iron castings business dropped faster and deeper last year than ductile iron. As a result, gray iron, which is the bulk of ferrous castings business, is simply working its way back up to a more normal ratio with other types of castings.

Specialty irons also are performing a little better than ductile or the general run of iron castings. Compacted graphite iron castings are showing up well in the slight business upturn of the first quarter.

The gains are slight, but very broad. Even though some of the big castings markets, like mobile equipment, are still slow foundries are beginning to get a little more business from components makers who supply the truck and farm machine and construciton machinery plants. Diesel engines, also important to these heavy mobile equipment markets, have been showing a slightly better performance than sales forecasts for the mobile group would suggest.

There doesn't seem to be any particular geographic pattern to the gains.

Big foundries that sell across the central U.S., an important market for heavy castings, say they are getting about the same kind of recovery there that they get from their Sunbelt, or Eastern accounts.

The very mild gains, have been hitting non-ferrous castings about the same way. January began to move up. For a number of producers, apparently, February saw this stall for a while. But, as the month ended, the upward movement began again and has continued through the March period.

Forgings

In 1982 custom die forging orders fell 44 pct below 1981 figures. After such a gloomy year any ray of sunlight is welcome. Through the first half of 1983 that flickering beam of hope is being supplied by the automotive industry.

"Several companies have already reported increases in automotive orders," says one industry member.

Unfortunately, the percentage of forgings going into passenger cars is on the decline.

At present, only 6 pct of closed die forgings are used in cars. As a result, increases in auto sales impact forging firms only marginally.

Aerospace contractors purchase the biggest chunk (about 35 pct) of custom die forgings, but that industry has been sputtering. Orders for commercial aircraft continue to soften, although spending for military aircraft is holding up. Increases in military aircraft budgets are being felt in some forge shops. Increased military ship production also is resulting in new forging orders.

The other large markets for forgings, however, remain heavily depressed. They include farm equipment, off-highway, truck, and oil field products markets. Although housing starts are up dramatically, the strike at Caterpillar Tractor Co. and a large surplus of construction equipment is hindering growth of the off-highway equipment industry.

As the GNP improves, the forging industry should benefit. However, growth will be slow because too many industries served by forge shops could remain depressed through much of 1983.

In addition, the forging industry traditionally trails the leading edge of an economic recovery by six months, although some say that recovery this time around should be more rapid because right now forging inventories are very low.

Heat Treating

Manufacturers of industrial heating equipment and the commercial heat treaters are still in the economic doldrums of 1982. Neither group sees anything better on the horizon for 1983; only hope.

Domestic orders for industrial heat processing equipment for 1982 slipped by 35 pct from 1981. What's even more disturbing is that recent figures show a sharper rate of decline. The figures for the last quarter of 1982 were off from 1981 by almost 48 pct.

The signals from builders of industrial heating equipment are mixed. Many believe that orders will pick up sometime after mid-year. But some cling to their earlier predictions that the slide will continue into 1984.

Total orders for 1982 reached slightly over $300 million, significantly below what industry sources had predicted. The slowdown in orders is being attributed to just about everything that has impacted on the economy in general.

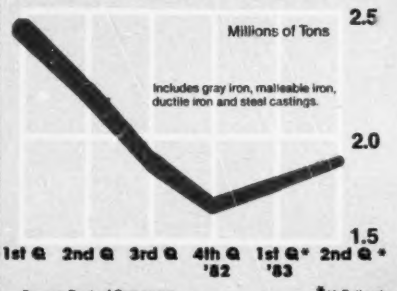
The commercial heat treaters, too, have taken their lumps. Final figures for 1982 showed a drop of more than 16 pct in billings from the prior year. But here again, slippage in the last quarter of 1982 was a whopping 32 pct.

Some slippage is expected to continue through 1983—perhaps on a smaller scale. One spokesman suggests 6 pct as a reasonable estimate.

Heat treating activity is picking up slightly in the depressed north-central states—but only slightly. The lack of activity in farm and off-the-road equipment could hold this area back for quite some time.

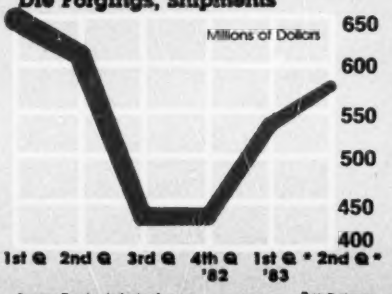
Energy-related activity in the Southwest also remains in the doldrums for the heat treaters. The West Coast is beginning to perk up with some billings coming from defense work and from high-technology industries.

Ferrous Castings, Shipments



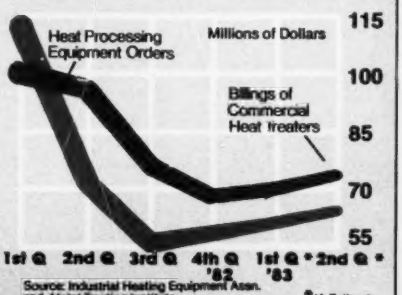
Source: Dept. of Commerce *IA Estimate

Closed Impression Die Forgings, Shipments



Source: Forging Industry Assn. *IA Estimate

Heat Treatment



Source: Industrial Heating Equipment Assn. and Metal Treating Institute *IA Estimate

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QUARTERLY FORECAST

Aircraft

The negative trend of the last several years seems likely to continue for most of 1983 for commercial aviation, with all major airframe manufacturers reporting depressed demand for new aircraft. T. A. Wilson, board chairman of Boeing Commercial Aircraft, echoes the common sentiment when he says commercial orders will continue at reduced levels until a general worldwide economic recovery begins and airline traffic growth and profitability start to reflect this turnaround.

Economic analysts at Boeing project the trickle-down effects of such a recovery are at least one year away from impacting the manufacturers. Officials at the Douglas Aircraft Div., of McDonnell Douglas, peg the time lag at about nine months. If that is indeed the case, 1983 promises to be a slow period for the industry. Already, orders during the first quarter are lagging substantially behind one year ago (when total new orders wound up being less than half of 1981's figure). The momentum created by a spurt of sales and novel leasing arrangements in the fourth quarter of 1982 has failed to carry over into the new year.

The manufacturers have good reason to be bearish. Used aircraft continue to clutter the market, several major U.S. carriers remain on shaky financial ground and recent airline forecasts are pessimistic. Despite lower oil prices, the International Air Transportation Association expects record losses in 1983.

"The oil companies do not necessarily pass price cuts on to us," says David Kyd, a spokesman for the group. "Nothing on the cost side could equate what we could get from an economic upturn."

Losses for airlines in 1983 could total $2.3 billion, above last year's $2 billion loss. Demand for seats is expected to rise by 2 pct this year, but excess capacity should rise by 3 pct.

Engines & Turbines

Shipments of engines and turbines are expected to continue their downward slide in the second quarter, but certain segments of the wide-ranging category will see some improvement.

The utilities market slump is expected to last well into the decade. As one industry analyst points out, "It took a long time to shut them down. With all that extra capacity to soak up, there will be a substantial lag in recovery." He adds there are no new nuclear projects, domestic or international, and prospects are dim "for the equipment suppliers to the electric utilities industry."

With crude oil pricing so low, new refinery business is at a virtual standstill. "But there's still business from revamps," according to one executive. He adds that, in general, he's not expecting any notable increase in capital expenditures by his customers. "They can satisfy their markets with the equipment they have. . . . We expect 1983 to be about the same as 1982," he estimates.

Cogeneration is beginning to catch on. Manufacturers of turbine generator sets are concerned it will erode their market.

The diesel engine end of the industry is beginning to come alive again. An analyst for a major manufacturer says, "Overall, the industry is tracking a recovery. There are some questions and changes, but the order board has been firming since January."

Orders for diesel engines by truck makers normally are tied to increases in tonnage moving; this time, there does not appear to be a rapid increase in tonnage moving, but retail sales have firmed more quickly than other economic indicators. The analyst forecasts that the market is beginning to exhaust excess capacity and that the trend seems to be toward ordering new trucks rather than ordering parts for repair.

Welding

It seems incredible that the welding industry is still reeling from such a tremendous setback in 1982 after having coming off the best year in its history—1981.

From all appearances, however, the worst is over, and there are some signs of improvement here and there. Examples are automobiles and construction industries, both heavy users of welding.

According to statistics compiled by the National Welding Supply Association, Philadelphia, the fourth quarter of 1982 was the worst since the first quarter of 1979.

Things weren't much better in the first quarter of this year, but there has been an improvement. Look for a more pronounced improvement during the next quarter.

"January was the first month in which our business improved since last summer," says one welding distributor from the West.

"Our outside sales received more positive support; and we noticed a little upward movement in the construction area."

A Midwestern distributor has this to say: "Certain of our customers are busier than others, but most are still plugging along at lesser volume levels. There seems to be a lull in business activity as everyone waits for a major turnaround."

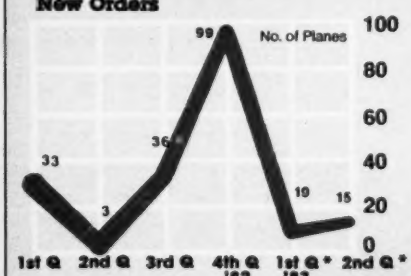
"We're seeing gradual upturn now," another distributor remarks, "and if interest rates continue to drop we should see a more accelerated comeback by April or May."

Although a small slice of the welding market, robotics is poised for a big jump in sales.

This will help in the sale of solid Mig wire and equipment.

But the one industry that will help welding a great deal—defense—has not yet come through with the contracts.

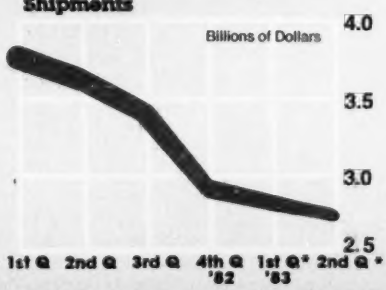
Commercial Aircraft, New Orders



Source: Aerospace Industries Assn., Airbus, Boeing and McDonnell Douglas

*IA Estimate

Engines and Turbines, Shipments



Source: Dept. of Commerce

* IA Estimate

Welding, Shipments

Source: National Welding Supply Assn.

* IA Estimate

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QUARTERLY FORECAST

Fasteners

"There's increased buying, sure, but not from us," says one standard fasteners maker in Ohio. "I expect you'll see quite a few closings in the next few months due to the Commerce Dept's thumbs down," he adds.

The "thumbs down" was the negative conclusion of a U.S. Dept. of Commerce study requested by the Secretary of Defense. The study considered claims that the domestic standards industry could not react adequately (should mobilization be required for some military emergency) if imports continue unchecked.

"Commerce said we can safely and comfortably rely upon an 8,000 mile pipeline to Japan. So we can also safely watch the domestic standards industry disappear," says an industry observer.

Meanwhile, the industry is continuing to experience the worst sales period in decades. "Last year, particularly the last few months of it, was an unmitigated disaster. I don't see '83 as any better for the standards industry. In fact, it will probably be far worse. We just cannot compete with what's coming in from Asia. No way," says an industry source.

"There will be no standard mechanical fastener industry in this country in a few years," predicts one expert.

Other kinds of mechanical fastener companies, those that make so-called "specials" or engineered fasteners are not nearly so pessimistic. Says one company vice president, "If 1983 is nearly as bad as '82, we'll be surprised. I'd say we'll be up by at least 20 pct over '82 when the final figures are in."

Says another "the standards market is not even a nickle and dime business. We got out years ago. What we're left with is a pretty good value-added bet." He does not feel, as some others do, that it's only a matter of time before the foreigners wipe that part of the industry out, too.

Screw Machine Products

Screw machine products manufacturers are beginning the second quarter of 1983 with slightly higher sales and more optimism than the dismal last months of 1982.

"The improvement is only very small but it is something we have not seen in a long time," comments one source.

At this point both new orders and optimism are particularly fragile commodities. "We have no way of knowing whether the upturn is going to continue or whether it is simply a small spurt of new orders," says an industry spokesman. "Maybe when we get inventories where they belong, business will be right back down again."

Despite its delicate condition, small growth should continue through the second quarter as the general economy picks up slightly and the screw machine products industry follows along. Significant increases in sales in the housing and appliance industry as well as a pick up in automotive sales should help the industry recovery.

About one-third of all screw machine products are targeted for the automobile market, so car sales increases in the last quarter of 1982 and the first quarter of 1983 have been good news. New car sales for 1983, although up from last year, are still far from spectacular. In early March, for example, domestic sales of U.S.-made cars increased only 2.7 pct compared to a similar period in 1982, although analysts are predicting that sales will gather strength at the end of the second quarter and through the third and fourth quarters.

Increasing home sales and housing starts mean that more screw machine products are finding their way into appliances, plumbing equipment, and electrical supplies.

Increases in military spending are beginning to be felt.

Stampings

Stampers say business looks better in the first half of 1983 than it has in more than a year.

Preliminary first quarter results indicate a definite uptick from a dreary second half of 1982.

The reason for the higher hopes? Primarily, increased demand from the automotive and housing-related sectors.

Stampers are beginning to receive some new orders from their customers who supply the automotive and appliance industries.

A major Midwestern stamper, who complained last year about so many "immediate delivery" requests, says, "They're not as bad on short-notice orders. Before they were buying only small quantities, just what they needed."

There's a lot more quoting activity, but it's taking longer for customers to get the quotations; apparently stampers have cut personnel so sharply that even the mild pickup is taxing the pared-down staffs.

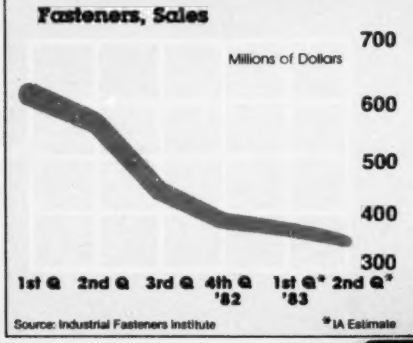
Many stampers are reporting better schedules and even call-backs of some laid-off workers. Most feel that the economy is headed in the right direction.

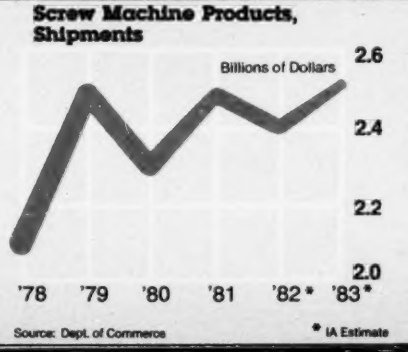
Farm implements are still way down, though. With crop prices so low, farmers are being cautious; plus, there's still plenty of inventory sitting in distributors' yards.

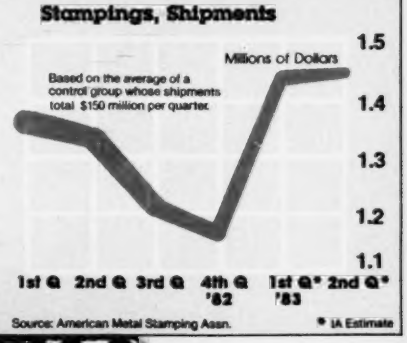
The Caterpillar strike has hurt stampers who supply that industry giant.

Cummins, however, is "enjoying the Cat hiatus," according to one stamper. "They're making more engines, and ordering more and farther out," he says.

Some words of caution from one executive: "Everyone's seen more activity in January and February, but don't expect business to jump from disaster to boom overnight."







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QUARTERLY FORECAST

Bearings

The antifriction bearing industry, which saw sales drop off about 15 pct in 1982, should recoup slightly in the first half of 1983. For the full year, recovery could reach a modest 5 to 8 pct.

At the start of 1983's second quarter, however, bearing manufacturers have yet to feel much pickup in orders, especially from OEM manufacturers. Some increases in aftermarket sales have been observed.

OEM sales are slow because most factories heavily serviced by bearing manufacturers remain deeply mired in the recession. These depressed industries manufacture general industrial machinery, farm equipment, construction machinery, railroad supplies, machine tools, oil field goods, and aircraft.

"Most industries which buy large quantities of bearings have yet to turn the corner of this recession," reports one industry source. "But while industrial production remains low, consumer goods production is showing a few bright spots."

The brightest spot is the automobile industry which accounts for approximately 30 pct of all bearing sales. Automobile sales have picked up slightly in the last quarter of 1982 and through the first quarter of 1983. Indications are that during the next few months, these tentative gains will strengthen. For the year automotive production increases may reach 30 pct although 10 to 15 pct are probably more realistic figures.

The auto industry may carry the bearing industry on its back from a depressed year to one of minimal growth.

As companies dig themselves out of this recession, they will put off buying new machinery and equipment for a while.

However, with production increasing, old equipment is shouldering the increasing burden.

Valves

The valve industry is still trying to recover from blows to industrial and municipal markets in late 1981 and the oil patch in early 1982; it doesn't appear the patient will be on its feet again by the second quarter, though the prognosis has improved.

Valve manufacturers are reporting that quotation activity is up—particularly in the AWWA municipal and nuclear ends—but that even improved order books in the spring won't result in a "significant upturn that affects shop loading until the third or fourth quarter," estimates one Northeastern executive. "Right now, the first really good bookings forecast month is May," he adds.

Another executive, in the steam end of the business, says all the industrial markets are down and probably will continue flat, at least through the third quarter.

"Except for the oil industry, all are going to be slow coming out of this recession," he predicts.

Valve makers tied in with the energy markets—oil, gas and electric power—generally expect business will hit bottom in the first part of 1983, lagging the rest of the industry, which saw rock bottom at the end of last year. While one executive says his company has "no nuclear business to speak of," another says that older projects are "perking along" and even speeded up, with new projects on the horizon.

Two complaints being voiced by a number of executives: Many companies are underbidding on small projects just to fill their shops, making it impossible to make any money on the little bit of work that's around.

Second, many are buying castings offshore, forcing the domestic industry to shrink further. There's concern that when business comes back, the domestic capacity won't be there and prices will shoot up.

Gears

"Nothing will happen in '83. We wish we could all die and wake up in the middle of 1984," laments a gear industry source.

And that's about the most optimistic prediction anyone in the industry has for the second quarter, and the rest of the year.

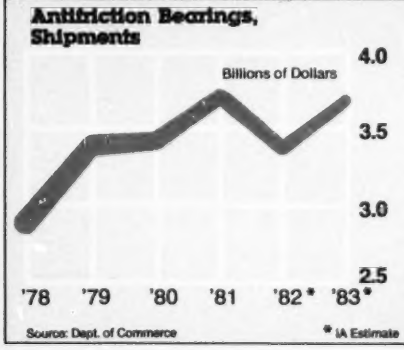
Some gear makers may find business down as much as 50 pct over second quarter 1982. One problem is the industry's tendency to lag the economy by six to nine months. "And I don't see that we've turned the corner, despite what the Administration says," adds the industry source. "Interest rates are still too high."

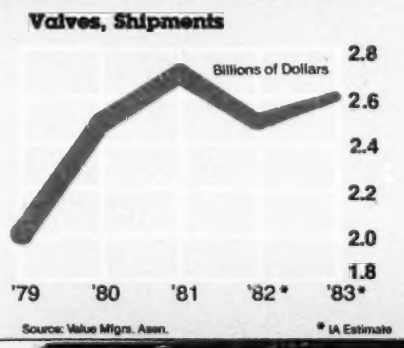
Which brings us to the subject of the huge budget deficit. Gear makers say customers are nervous that interest rates will shoot up again as soon as the government comes into the money markets to borrow. Imports continue to be a problem, especially in such high-priced items as speed reducers. Manufacturers' inventories are cut to the bone.

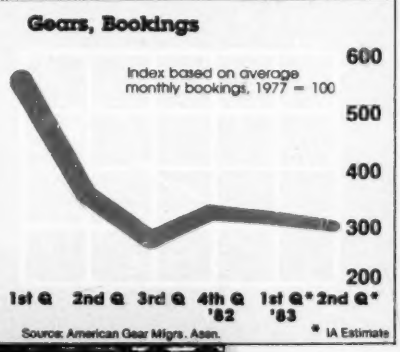
It may be of little consolation, but gear makers who supply a variety of industries say the dropoff in business has been about even across the board. Steel and commercial construction are still way down. Floating mortgages are discouraging builders. Idle capacity means business from steel producers is still sometime off. Some manufacturers are finding solace in steady business from the paper and defense aerospace industries. Also, updating, parts and repairs are keeping others afloat as they ride out the recession's storm.

A leading Midwestern gear maker predicts that in spite of economic improvement, "utilization of current equipment is so low that we won't see much purchasing of capital goods for a long time."

Certainly not in time to save second quarter '83.







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QUARTERLY FORECAST

Shipbuilding

The U.S. merchant shipbuilding industry is dead in the water—virtually nonexistent. The program to expand and modernize the U.S. Navy is moving along at a fair pace—while defense budget cuts are debated on Capitol Hill.

Those shipyards able to build, reconvert or repair Navy ships have little to worry about. They are getting work and will continue to receive more as the naval shipbuilding program gets up to full speed in the mid-1980s.

For shipyards that must rely on merchant ship construction, the offshore oil rigs, tugs and barges, and general repair work, the outlook is extremely bleak.

There is a good prospect some shipyards could disappear or be absorbed into other companies in the next two years.

Here's how a spokesman for the Shipbuilders Council sums up the current situation in merchant construction: "Contracts for only *three* merchant ships of 1,000 gross tons and over were placed with our industry during all of 1982. None of these were cargo vessels. Drill rig orders totaled two. At the end of last year, the industry's order book consisted of 22 merchant vessels and 25 drill rigs, all with completions scheduled for the present year."

An official at the U.S. Maritime Administration takes a similar view: "Only 18 deep-draft commercial vessels were projected to be under construction or on order as of the beginning of this year.

"That's 17 fewer than a year earlier, representing a 414,000-ton decline in gross tonnage.

"There is the lowest number of deep-draft commercial ships on order in U.S. shipyards since 1956 and the lowest gross tonnage outlook since 1966. All but four of these 18 ships are scheduled for delivery by the end of 1983."

And market researchers at a large steel company make this assessment: "In 1982 there were only three merchant contracts awarded domestically.

"All three came in April and that was the year's final tally. Private total U.S. shipyard employment has reached a ten-year low. Growth in naval shipbuilding will be the only plus in this market in 1983."

At the start of his term, President Ronald Reagan announced two maritime aims—enlarging the Navy and restoring commercial shipbuilding to a decent position in the world market.

The shipbuilders have been dismayed by the Administration's backing away from the second half of this commitment.

The spokesman for the builders told a Congressional committee, "By decision and indecision, by word and action, the Administration has evidenced a disposition to relegate commercial shipbuilding in the U.S. to extinction."

Rail Cars

The recession was just the final blow for rail car builders.

The industry's troubles actually began, although it was not apparent, in 1978 and 1979. Then orders for new cars were at high levels. In 1978 new orders totaled 130,000 cars. The following year they were 119,000 cars.

From there the path was downward—in 1980 to 46,000, only 18,000 in 1981, and last year just a little over 7,600.

"Frankly, there was overbuilding in the late '70s," says an industry spokesman. But that was not the full cause of the present dismal state of the industry.

Railroad mergers brought combinations that led to duplications of car stock.

Deregulation of the railroads allowed them to operate at greater efficiency with more existing cars placed in the idle stockpile.

And finally came the Great Recession, reducing the amount of goods hauled and further curtailing the need for cars.

Now, even if the railroads share in the improving economy, they won't need to order many more cars. Too many existing ones are mothballed. The majority of orders coming into builders now are for cars designed for specific, specialized hauling.

As the chart indicates, new orders will be rare commodities this year. In January 1982, the builders received orders for 835 new cars. This past January the total was only 501. And indications are that February's total could be half that.

A government analysis of the rail car outlook for this year cites "continued low levels of demand and shipments. Production is forecast at 25,000 cars, about the same level as 1982. New orders will not begin to increase substantially until the demand for rail services increases and then only after the present surplus of inactive cars is absorbed."

The builders themselves hope to see an upturn in orders starting in the last quarter of this year and continuing into 1984. But they've got their fingers crossed.

An analysis by the market researchers for a steel company notes, "With rail car builders' backlogs virtually nil, even if freight car orders double this year, shipments will remain substantially below last year."

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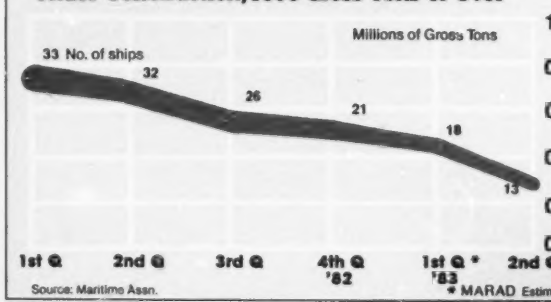
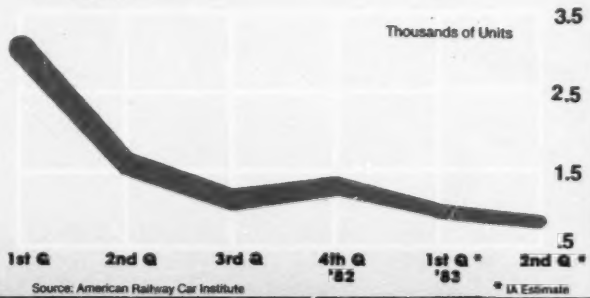
Shipbuilding, Commercial Ships on Order or Under Construction, 1000 Gross Tons or Over



Source: Maritime Assn. * MARAD Estimate

Rail Car, Orders



Source: American Railway Car Institute * IA Estimate

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DIRECT REDUCTION IS A SURVIVOR

New reduction projects lagged in 1982, but there is considerable fresh activity on the horizon now.

BY GEORGE J. MCMANUS

Direct reduction has come through the steel slump in better shape than might have been expected.

Last year saw a continued buildup of direct reduction (DR) experience and capacity. New processes gave promise of closing the loop between direct reduction and coal.

There was work on integrating solid state reduction with the smelting of molten iron.

New reduction projects lagged last year, but considerable fresh activity is now on the horizon.

Coming up are reduction plants in Iran, Egypt, and probably the Philippines.

In the U.S., direct reduction could come through the back door. The Klockner-Scrap (KS) process, which could provide a good reducing gas as well as taking a lot of scrap off the market, was given serious consideration at one large mill.

All this is looking on the sunny side of a picture that has its gloomy aspects.

Direct reduction frequently suffers in a recession because of the general cuts in steel spending.

The reduction process gets an extra jolt because scrap prices come down in a slump.

In 1982, the worst recession since the 1930s made the negative effects on scrap and spending particularly severe. To make matters still worse, the price of natural gas, which is the ideal reducing agent, continued its rapid rise in industrial countries.

As a result, direct reduction received some painful setbacks. Shutdown last year were the only two mill-based reduction plants in the U. S.—at Armco Inc. in Houston and at Georgetown Steel Corp. in South Carolina.

In the case of Armco, a long-term natural gas contract at Houston expired last year.

Armco faced the prospect of paying something like 15 times more for a new gas supply. The company decided to close its gas-based reduction plant.

The shutdown underlined one of the basic problems of direct reduction. "The best processes are natural gas processes," says T. E. Dancy, technology vice president for Sidbec-Dosco, Ltd. The two most widely used of these processes are Midrex and HYL.

Sidbec-Dosco installed two Midrex units.

"When we justified these plants, we had favorable economics," says Mr. Dancy. Because of government policies, he says, natural gas prices have zoomed despite abundant supplies of the fuel.

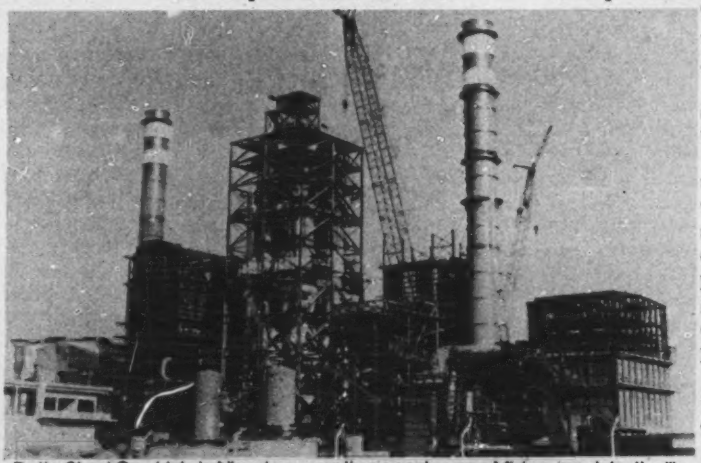
With scrap prices falling, the economics have changed.

"We no longer have a competitive situation," says Mr. Dancy. Accordingly, Sidbec-Dosco has sidelined one of its reduction plants.

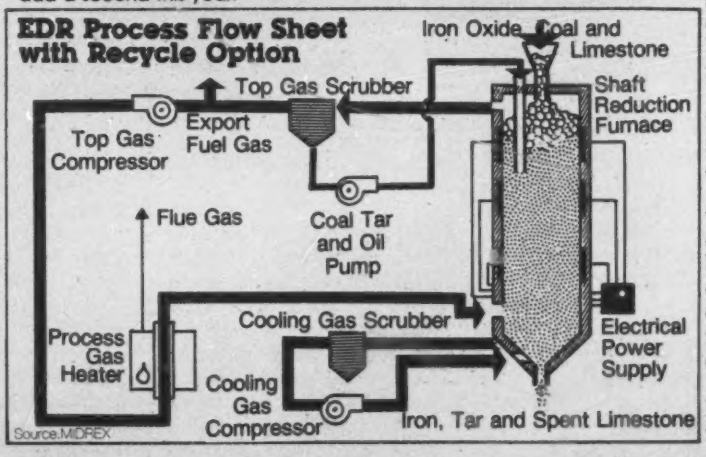
"DRI (direct reduced iron) is now only used for controlling residuals."

There are places where natural gas is still cheap and there are coal based reduction processes. In 1982, however, no one was looking for more iron and steel capacity.

"There were no new DR installations contracted in 1982," says J.



Delta Steel Co., Ltd., in Nigeria currently operates one Midrex module. It will add a second this year.



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E. Bonestell, vice president, Midrex Corp. This was the first time direct reduction was shut out in many years, adds Mr. Bonestell.

For steel and direct reduction, the tide may now be turning. "You've already seen a jump in the price of scrap," says Mr. Bonestell.

Direct reduction people are hoping for a further jump. "What you run into is the cost of scrap versus DRI," says G. E. McCombs of Dravo Engineers and Contractors. "We're still optimistic about the DRI market." Dravo builds plants of the HYL and Krupp-CODIR types.

While new contracts lagged last year, a number of projects started earlier were completed. The second Midrex unit at ISCOTT in Trinidad came on stream. One Midrex module at Delta Steel Co., Ltd., in Nigeria began operating in 1982. When the second unit starts in 1983, Delta will have more than 1 million tons of reducing capacity.

In Saudi Arabia, one Midrex unit came on stream last year and the second will start in 1983. A 650,000-ton Midrex plant in Malaysia is scheduled for startup in 1984.

The second HYL III plant of Hylsa began operating at Monterrey, Mexico, in 1982. Two HYL plants in Indonesia were scheduled for 1982 startup. Coming up is the 2-million-ton HYL complex at Sicartsa in Las Truchas, Mexico.

A 150,000-ton plant employing the ACCAR process of Allis-Chalmers began operating at Orissa, India, in January. ACCAR uses a rotary kiln for reduction and is flexible from a fuel standpoint. The Orissa plant is operating with 80 pct coal and 20 pct oil.

These and other installations are providing a significant supply of reduced iron. According to the Industrial Economics Research Institute of Fordham University, world reduction capacity was more than 17 million tons in 1980 and will reach nearly 40 million tons by 1987.

Current capacity is enough to make reduced iron readily available on the open market at reduced prices. In the 1982 recession, prices being quoted in the U.S. were down to a range of from $90 to $100 a ton. This range was a reflection of market conditions, not costs.

The FIOR plant in Venezuela is exporting all its output. After a long debugging period, the FIOR unit is now producing 1,100 tons a day. FIOR iron is in the form of briquettes, which have the advantage of traveling well. The new Malaysian Midrex plant, which will be strictly an export merchant op-

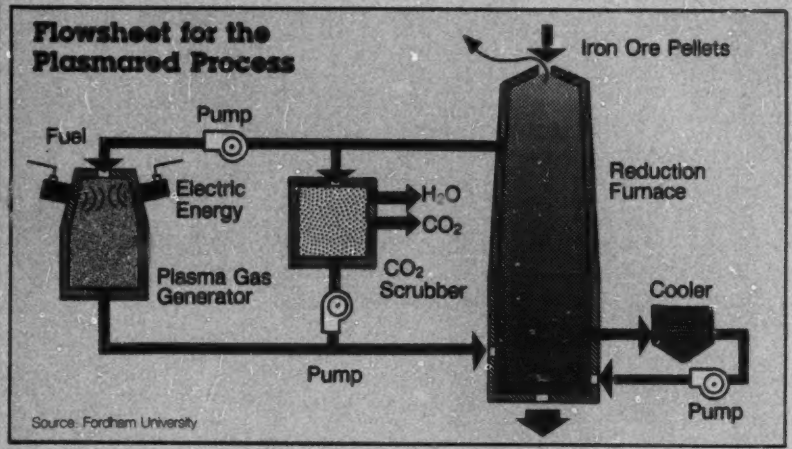
(Cont. on p. MP-8)

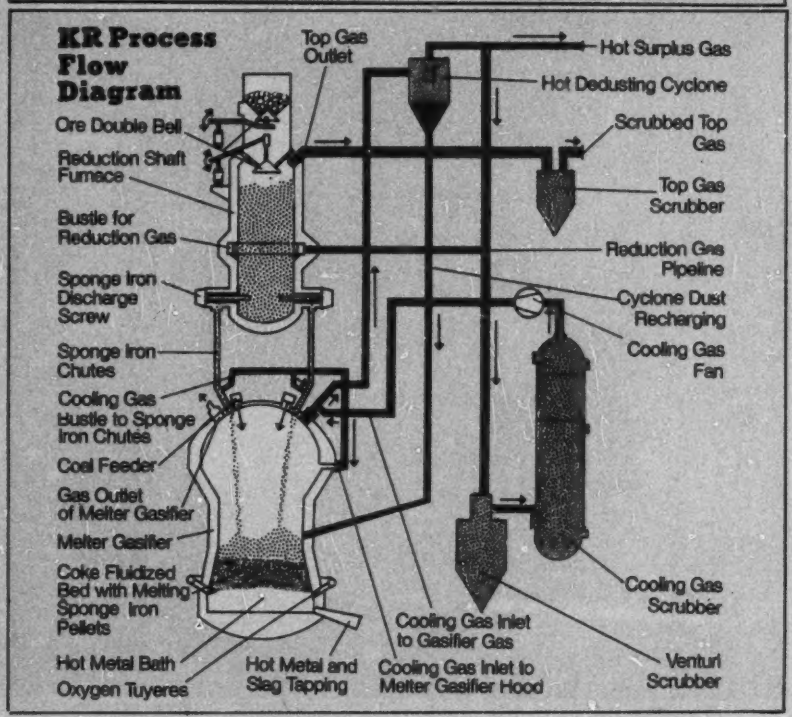
World Capacity to Produce Steelmaking-Grade DRI

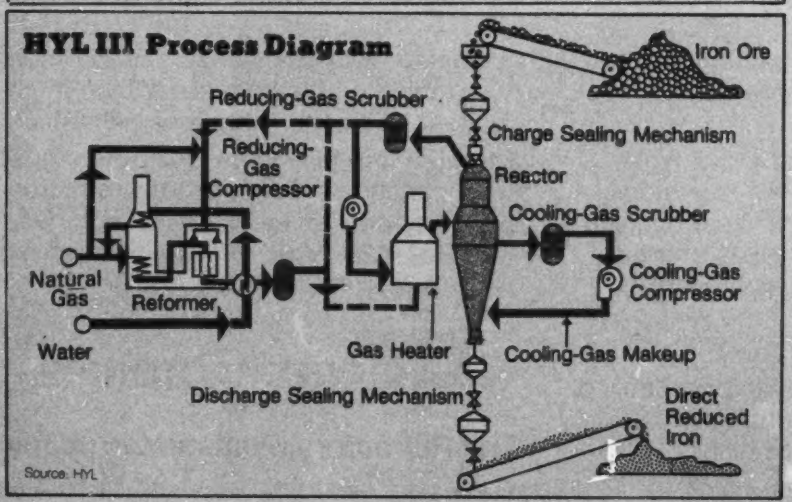
Capacities Through 1980 and Projected Through 1987

BLAST FURNACE TABLE	Date of Startup	Process	Reducing Agent	Annual Capacity 000 tons
North America				
Canada—Niagara Metals, Niagara Falls	1973[1]	ACCAR	C/O/G	40
Canada—Sidbec-Dosco, Contrecoeur	1973	Midrex	G	440
Canada—Stelco, Bruce Lake	1975[2]	SLRN	C	385
Canada—Sudbury Metals, Falconbridge	1976[2]	ACCAR	O/G	265
Canada—Sidbec-Dosco, Contrecoeur	1977	Midrex	G	660
U.S.A.—Oregon Steel, Portland, Oregon	1969[2]	Midrex	G	330
U.S.A.—Georgetown Steel, Georgetown, S.C.	1971	Midrex	G	440
U.S.A.—Armco Steel, Houston, Texas	1972	Armco	G	365
U.S.A.—DR Corp., Rockwood, Tennessee	1976[1]	DRC	C	65
Latin America				
Argentina—Dalmine Siderca, Campana	1976	Midrex	G	365
Argentina—Villa Constitucion, Acindar	1978	Midrex	G	465
Brazil—Acos Finos Piratini, Charquedas	1973	SLRN	C	70
Brazil—Usiba, Bahia	1974	HYL	G	255
Brazil—Cosigua, Santa Cruz	1977[3]	Purofer	O	—
Mexico—Hylsa, Monterrey	1957[1]	HYL	G	105
Mexico—Hylsa, Monterrey	1960[4]	HYL III	G	285
Mexico—Tamsa, Vera Cruz	1967	HYL	G	275
Mexico—Hylsa, Puebla	1969	HYL	G	350
Mexico—Hylsa, Monterrey	1974[3]	HYL	G	530
Mexico—Hylsa, Puebla	1977	HYL	G	770
Peru—Siderperu, Chimbote	1979	SLRN	C	110
Trinidad & Tobago—ISCOTT, Point Lisas	1980	Midrex	G	465
Venezuela—Fior de Venezuela, Matanzas	1976	FIOR	G	440
Venezuela—Sidor, Matanzas	1977	Midrex	G	390
Venezuela—Sidor, Matanzas	1977	HYL	G	465
Venezuela—Sidor, Matanzas	1979	Midrex	G	1405
Venezuela—Sidor, Matanzas	1980	HYL	G	2315
Europe/Asia				
West Germany—Thyssen, Oberhausen	1970[1]	Purofer	G	165
West Germany—Hamburger Stahl, Hamburg	1971	Midrex	G	440
Italy—Kinglor-Metor, Buttrio	1973[1]	K-M	C	10
Italy—Ferriere Arvedi, Cremona	1976[2]	K-M	C	45
India—Sponge Iron India, Paloncha, A.P.	1980[1]	SLRN	C	35
Indonesia—Krakatau Steel, Kota Baja	1978	HYL	G	635
Indonesia—Krakatau Steel, Kota Baja	1980	HYL	G	1900
Japan—Nippon Steel, Hirohata	1976[1,2]	NSC	K	165
Middle East/Africa				
Iran—NISIC, Ahwaz	1978[3]	Purofer	G	365
Iraq—Government, Khor Al-Zubair	1979	HYL	G	550
Qatar—QASCO, Umm Said	1978	Midrex	G	440
South Africa—Dunswart Steel, Benoni	1973	Codir	C	165
Oceania				
New Zealand—New Zealand Steel, Glenbrook	1969	SLRN	C	165
Total World Capacity (Year-end 1980)				**17130**
Projected Capacity[6]				
West Germany—Norddeutsche Ferro., Emden	1981	Midrex	G	970
India—Orissa Sponge Iron, Keonjhar, Orissa	1981	ACCAR	C/O	165
Nigeria—Delta Steel, Warri	1981	Midrex	G	1215
Trinidad & Tobago—ISCOTT, Point Lisas	1982	Midrex	G	465
U.S.S.R.—DEMK, Kursk	1982	Midrex	G	1840
Iraq—Government, Khor Al-Zubair	1982	HYL	G	1100
Mexico—Sidermex, Sicartsa	1983	HYL III	G	2205
Mexico—Hylsa, Monterrey	1983	HYL III	G	825
Saudi Arabia—HADEED, Al Jubail	1983	Midrex	G	880
South Africa—Scaw Metals, Germiston	1983	DRC	C	85
Burma—Government	1983	K-M	C	20
Argentina—Sidersur, Rio Negro	1984	HYL III	G	550
Mexico—Premexsa, Tampico	1984	HYL III	G	1100
Libya—Government, Misurata	1984	Midrex	G	1215
Malaysa—Sabah Project, Labuan	1984	Midrex	G	715
United Kingdom—British Steel, Hunterston	1985[7]	Midrex	G	880
Iran—NISIC, Ahwaz	1985[7]	Midrex	G	1325
Iran—NISIC, Ahwaz	1985[7]	HYL	G	1100
Spain—Presursa, Huelva	1985	Midrex	G	855
Ecuador—Ecuasider, Machala	1986	Midrex	G	440
India—Government, Bihar	1986[7]	SLRN	C	130
Peru—Siderperu, Chimbote	1986[7]	Codir	C	220
U.S.S.R.—DEMK, Kursk	1987	Midrex	G	3750
Total Projected Capacity (as of 6/31/81)				**22050**
Total Projected World Capacity (year-end 1987)				**39180**

Reducing Agents—Coal (C), Oil (O), Natural Gas (G), Kerosene (K). [1]Operates either totally or in part as a pilot or demonstration plant. [2]Plant is currently shut down. [3]Plant is being dismantled. [4]Conventional HYL unit was converted to HYL III, with startup in 1979. [5]Conventional HYL unit being converted to HYL III, with scheduled startup in 1981. [6]Plants under construction, contract, or agreement. [7]Project is currently delayed. Source: Fordham University.







(Cont. from p. MP-5)

eration, will be equipped for hot briquetting.

In 1983, a number of completely new projects will move forward. Coming up in the second quarter is a 3.2-million-ton direct reduction complex in Iran. The steel phase of this project, which was interrupted by Iran's political upheaval, is already in the construction stage.

The Midrex process is being offered in Iran by a consortium that includes Korf Engineering and Voest-Alpine. Kawasaki Steel Corp. is bidding with HYL technology.

Also expected in the second quarter is a contract for a 750,000-ton direct reduction plant at Alexandria National Steel in Egypt. Nippon Kokan, which has invested in the complex, has already been awarded the contract for the steel shop. Bidding with Midrex technology are Lurgi and Kobe Steel, which is another investor in the Alexandria project.

Kawasaki Steel Corp. is offering the HYL process for Alexandria Steel. Financial support is coming from the World Bank and the International Monetary Fund.

In the Philippines, a 1.4-million-ton steel plant is reportedly ready to go. The project will include a rotary kiln reduction plant of Kawasaki design.

In Sweden, the government had reportedly provided backing for a Plasmared plant to reduce iron ore pellets. Developed by SKF Steel, Plasmared employs a shaft furnace for reduction and a plasma arc torch for generating and heating the reducing gas in a separate vessel.

A 70,000-ton Plasmared system has been operating at Hofors in Sweden since January 1981. This originally used natural gas, but more recent tests have shown the feasibility of having coal as the gas source.

The new Plasmared plant is scheduled to be tied in with the LKAB ore pelletizing operation. These pellets are low in silica and have been widely used in direct reduction operations.

Others are looking at the feasibility of tying direct reduction to iron ore operations.

"I think there will be a lot of activity in Canada," says D. R. MacRae, research supervisor for process development at Bethlehem Steel Corp. Like LKAB in Sweden, explains Mr. MacRae, the Canadian iron ore companies are anxious to upgrade their product.

The various reduction processes are being carried out on the basis of world energy sources, he adds. "You can divide the industrialized countries up into those where there is cheap electric-

ity and all others. The so-called plasma processes, which use electricity, will be favorable for Sweden, Norway, Canada and perhaps in Brazil."

Where natural gas is available at low cost, says Mr. MacRae, direct reduction is already an established process. Material from gas-based merchant plants, such as the ones in Malaysia, will be flowing into the world market.

"In this country," says MacRae, "I don't see it going ahead based on natural gas. All the plants that use gas are closing down. They'll have to be based on coal."

Mr. MacRae doubts that electric smelting of iron will find widespread use in the U.S. He does see a place for the new coal-based technology, such as Korf KR, which produces molten iron.

"Right now we have excess capacity in blast furnace hot metal. It will be considered very strongly at the time—for example, at Burns Harbor—when we would need some additional hot metal capacity."

In line with Mr. MacRae's thoughts on electric power, the engineering is 95 pct complete on a 400,000-ton Canadian plant of the INRED type. Developed by Boliden AB of Sweden, INRED prereduces iron ore in a flash smelting step. Final reduction and melting take place in the electric furnace portion of the single reactor.

A 60,000-ton INRED demonstration plant is operating at LuLea in Sweden. The 400,000-ton plant for Canada is covered by a letter of intent from IVACO Inc.

The process has drawn an "excellent response" from American steel companies, says R. A. Westman, president of Inred Iron, Inc. Domestic companies are interested in reducing mill oxides, says Mr. Westman.

The direct use of coal for solid state reduction of iron ore has never been an unqualified success. Most of the processes employ rotary kilns. There have been various problems, the greatest of which has probably been competition from low priced scrap.

Eleven SL/RN plants have been built. The two biggest of these—at Stelco in Canada and at Nippon Koka in Japan—are not operated on a regular basis. However, new SL/RN plants are scheduled for 1984 startups at ISCOR in South Africa and at New Zealand Steel.

Scheduled for start-up this year is the reduction plant of SCAW Metals Ltd. of South Africa. This will use the rotary kiln process of Direct Reduction Corp. A pilot plant has been operated by Direct Reduction in Rockwood, Tenn. The SCAW plant will be engineered and built by Davy McKee Ltd.

A completely different approach to coal-based reduction is the process of International Metals Reclamation Co., Inc. (INMETCO). A subsidiary of INCO, INMETCO reduces oxides on a rotary hearth furnace. The reducing action is provided by mixing crushed coal with the oxides and then applying heat.

INMETCO is now operating an 80,000 ton plant at Ellwood City, Pa. This is used to reclaim electric furnace dust and other oxides from stainless steel plants around Pittsburgh. For this particular application, nickel and iron oxides are fully reduced in the solid state, but a melting step is required for the final reduction of chromium oxides.

No melting step is needed for carbon steel oxides or iron ore, says Todd Grant, president of INMETCO. "We know the process does work on carbon steel wastes and ores," says Mr. Grant.

Because the carbon and oxides are in intimate contact, he says, the operation is very efficient. "We get a very fast reduction—in less than an hour, one trip around the furnace. In most of the kilns, it takes anywhere from 4 to 12 hours to run through the kiln."

The close contact of materials makes for low fuel consumption, says Mr. Grant. Energy use of 10 million Btus a ton is in line with the gas-based processes, he states. "Most of the coal-based processes are running anywhere from 16 million to 20 million Btus," he adds.

A third advantage cited for the INMETCO process is gentle handling. The pellets are deposited very softly. "We could lay eggs down on the hearth," says Mr. Grant. For this reason, it is not necessary to harden the pellets.

INMETCO is not interested in going into the direct reduction business. The company is offering its process to equipment builders and to users on a license basis.

A difficulty with many coal-based processes is the transfer of sulfur from the coal to the iron. The Lummus/Sumitomo RIOR process is designed to operate with a high sulfur fuel—petroleum coke—and to produce metallized pellets with less than 0.03 pct sulfur.

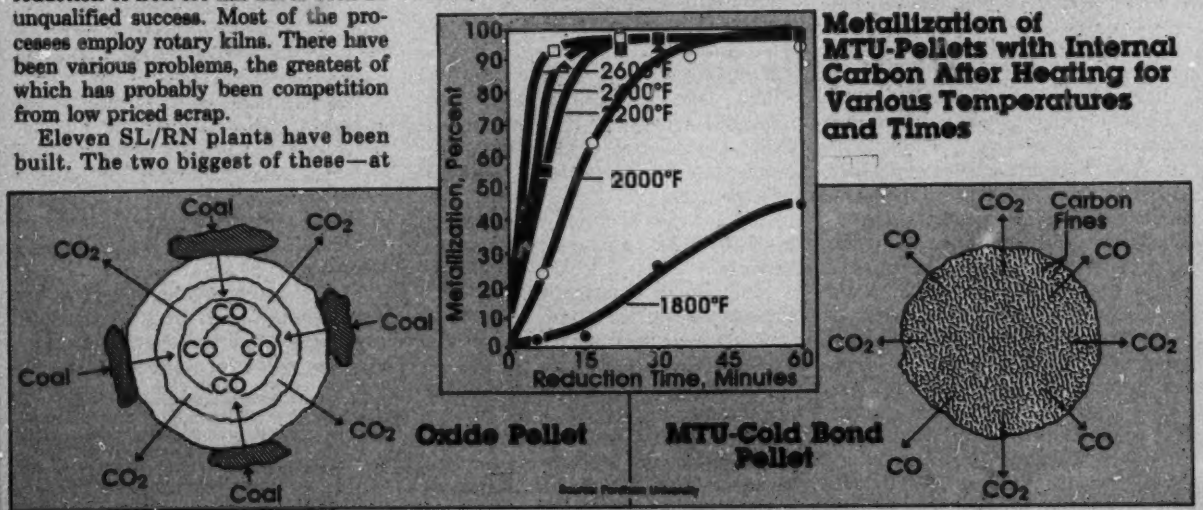
"We won't compete head-on with Midrex," says an official of CE Lummus. "The Midrex type process with cheap natural gas is tough to beat."

He does see RIOR making sense in a place like Venezuela, where a buildup of oil refining capacity is creating a big supply of petroleum coke.

Not really connected with direct reduction is the steelmaking concept that was being considered by Kaiser Steel Corp. This has apparently been shot down by the announcement that Kaiser intends to discontinue steel finishing operations as well as raw steel production.

At one time, Kaiser planned to shut down its blast furnace, but keep its rolling mills going. Serious thought was being given to making steel in the company's modern oxygen vessels with an all-scrap charge.

The KS (Klockner-Scrap) process is designed to melt scrap by injecting coal or some other form of carbon. Klock-

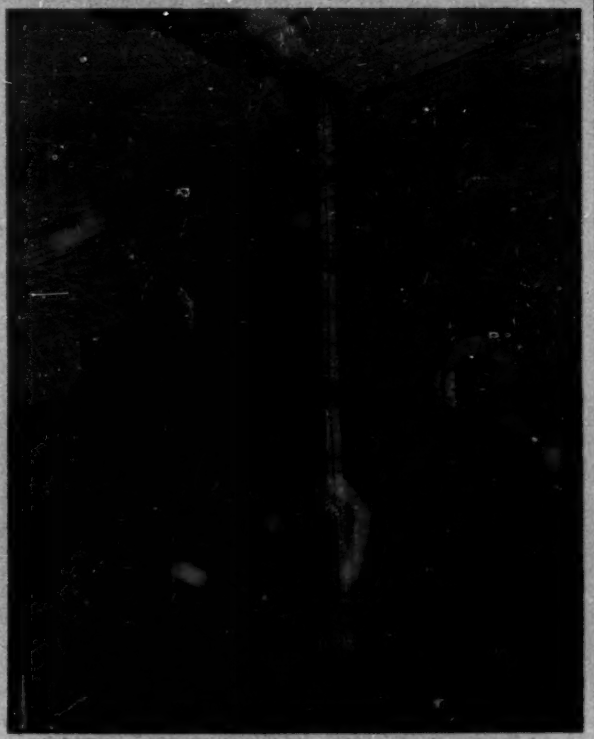


Metallization of MTU-Pellets with Internal Carbon After Heating for Various Temperatures and Times

Distributions of Estimated World Output of Steelmaking-Grade DRI

Millions of Net Tons	1979		1980	
Process	**Tons**	**Pct Total**	**Tons**	**Pct Total**
Midrex	4.13	55.6	4.37	55.5
HYL	2.43	32.7	2.61	33.1
Armco	0.23	3.1	0.24	3.1
SLRN	0.22	3.0	0.26	3.3
FIOR	0.22	3.0	0.25	3.2
Codir/Krupp	0.13	1.7	0.13	1.6
DRC/Hockin	0.03	0.4	0.01	0.1
Purofer	0.02	0.3	—	—
Kinglor-Metor	0.01	0.1	—	—
Accar	0.01	0.1	0.01	0.1
Totals	**7.43**	**100.0Pct**	**7.88**	**100.0Pct**

Source: Midrex Corporation.	1979		1980	
Country	**Tons**	**Pct Total**	**Tons**	**Pct Total**
Mexico	1.76	23.7	1.73	22.0
Venezuela	1.15	15.5	1.58	20.0
Canada	1.01	13.6	0.97	12.3
Argentina	0.92	12.4	0.86	10.9
United States	0.88	11.8	0.68	8.6
West Germany	0.56	7.5	0.49	6.2
Qatar	0.35	4.7	0.47	6.0
Brazil	0.34	4.6	0.31	3.9
New Zealand	0.17	2.3	0.17	2.2
Indonesia	0.14	1.9	0.41	5.2
South Africa	0.13	1.8	0.13	1.6
Italy	0.01	0.1	—	—
Peru	0.01	0.1	0.02	0.3
Trinidad	—	—	0.03	0.4
Iraq	—	—	0.02	0.3
India	—	—	0.01	0.1
Totals	**7.43**	**100.0Pct**	**7.88**	**100.0Pct**



A 150,000-ton plant which uses the ACCAR process developed by Allis-Chalmers came on-stream at Orissa, India in January.

ner, which has been closely associated with Q-BOP bottom blowing, has been working on the KS technique.

If the KS process is applied by someone and is successful, it will do two things. First, it will remove the ceiling that has been a big factor in holding down the price of scrap.

A second effect will be the generation of a great deal of reducing gas. Kaiser's Fontana shop, which has a suppressed combustion cleaning system, would have been equipped with a large gas storage vessel.

Kaiser had no plans for direct reduction. The off-gas was simply a valuable product of what is primarily a steelmaking operation. Pennsylvania Engineering Corp., which has built a number of Q-BOP vessels, is devising a system that would employ the off-gas for direct reduction.

In West Germany, gas is the primary product of a process that bears some resemblance to KS and has reportedly received government backing. The Humboldt process uses a liquid iron bath as a vehicle for gasifying coal. Coal, steam and oxygen are injected, producing a gas made up of carbon monoxide and hydrogen. Lime additions keep sulfur content to a very low level.

CRA, Ltd., of Australia and Klockner are participants in a plant that would employ the Humboldt process to gasify 860,000 tons of coal yearly at Klockner's Bremen Works. In a presentation last year, officials of KHD Humboldt showed how the gasification plant could be integrated with direct reduction.

The basic technology being employed in West Germany was developed by Applied Technology Corp. of Pittsburgh. Armco was once interested in this concept. The patent was taken over by the German group in 1978.

In a number of the new processes, the end product is liquid iron rather than metallized pellets. The Korf KR process (*IA*, Oct. 4, '82, p. MP-23) has two chambers. In the upper section, solid iron ore is partially reduced. In the lower section, coal is gasified while the iron goes through the final reduction and melting stage.

This feature shows up in the two-chamber process of Kawasaki Steel Corp. Designed to produce both iron and ferroalloys, this process makes a 60 to 70 pct reduction of iron in one chamber. In the case of chromium ore, there is a 30 to 50 pct reduction at a temperature of 1,770°F.

The final reduction in the main furnace takes place at temperatures up to 2,800°F for iron and up to 3,000°F for ferroalloy. The furnace operates on coke. Oxygen or air is injected through one set of tuyeres. Pre-reduced fine ore is blown in through upper tuyeres.

Kawasaki says the process reduces operating costs 15 pct when iron is made. For ferroalloys, says the company, the energy consumption is 50 pct less than with electric smelting.

The Plasmasmelt, Elred and Inred processes all come out with molten iron as the end product. All three use electric power. Plasmasmelt, as the name indicates, uses plasma to gasify coal and melt the iron.

Strictly speaking, any arc furnace employs plasma. However, the term is usually applied to a specific application of the concept. "It's generally heating some kind of gas and generally uses a non-consumable electrode," says M. G. Fey, manager of applied plasma systems, Westinghouse Electric Corp. "An arc is drawn between the electrodes and a gas is blown through."

The Westinghouse arc heater is used in both the Plasmasmelt and Plasmared processes. Mr. Fey is not too bullish about the outlook for early applications in the U.S.

"During this crunch, not much is being done on the development of new technology," he says.

Westinghouse is going ahead with a new plasma center near Pittsburgh. This should facilitate development of steel and non-steel systems. □

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EFFECTIVE MARCH 21, 1983

MATERIALS NEWSFRONT

Important Notice About Iron Age Scrap Prices

Beginning with the Jan. 21 issue Iron Age has been publishing only one set of scrap prices per issue—those with the effective date as close to the issue date as printing schedules permit. Prices for other weeks are available on a weekly basis through our Metal Price Phone Hotline or through our Weekly Price Newsletter.

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)..... gross-ton 80.50-86.9*
Old range, non-bessemer ..... gross-ton $32.78
Mesabi, regular-unscreened ..... gross-ton $32.53
Mesabi, non-bessemer.....gross-ton $32.25-32.53**

*80.50¢—Pickands Mather as of 1/27/81.
**86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

Steel Production, Composite Prices

(Effective March 21, 1983)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1983	To Date 1982
Net tons, in thousands	1,585	1,566	15,482	19,506
Capability Utilization Rate	54.7	54.0	47.9	59.4

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 2/14/83)	26.217	26.217	26.217	25.195
Pig Iron* * (Net ton = 2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton = 2240 lbs.)	$ 72.83	$ 72.83	$ 75.17	$ 80.17
No. 2 bundles	$ 51.83	$ 51.83	$ 51.83	$ 52.83
Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh .	$ 77.50	$ 77.50	$ 79.50	$ 88.50
No. 1 steel, Philadelphia	63.50	63.50	63.50	75.50
No. 1 steel, Chicago.....	77.50	77.50	82.50	76.50
No. 1 bundles, Detroit..	76.50	76.50	75.50	73.50
Low Phos., Youngstown	69.50	69.50	69.50	90.50
No. 1 mach'y cast., Pgh	79.50	79.50	79.50	86.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	113.50
No. 1 mach'y cast., Chi..	112.50	112.50	112.50	124.50

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
* *Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
* * *Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective March 21, 1983)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	76.00 (Nom.)	76.00-80.00	1/4/82
Copper (C)	77.00-78.00	78.00	3/21/83
Lead	20.50-23.00	20.00-23.00	3/10/83
Magnesium Ingot	134.00	125.00	6/1/81
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	38.00-40.00	40.00	3/1/83

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas . $2.00
Beryllium-aluminum 5% Be, per lb. contained Be $201.00
Beryllium-copper, per lb. cont. Be $121.00
Beryllium 97% powder 200 ..... $166.00
Bismuth, ton lots ..... $1.25-$1.40
Cadmium, under one ton ..... $1.05-$1.15
Calcium, ton lots, crown $3.05
Chromium, 99.8% $3.75
Cobalt, 99%, cathode $12.50
Gold per troy oz. $414.50
Indium, dollars per troy oz. $3.10
Iridium, dollars per troy oz. $600
Magnesium sticks, 10,000 lbs. $1.91
Mercury, per 76-lb. f.o.b. N.Y. ..$325-$350
Molybdenum, lb. tech. moly oxides, 20 lb. MO can $5.85
Nickel oxide sinter at U.S. points of entry $3.12
Palladium, per troy oz. $140
Platinum, per troy oz. $475
Rhodium, per troy oz. $600.00
Silver ingots, per troy oz. $10.61
Vanadium $4.94
Zirconium sponge..... $12.00-$17.00
(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Mar. 14—559.24
Mar. 15—604.01
Mar. 16—603.88
Mar. 17—604.91
Mar. 18—603.93

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	75½	66¼
Yellow brass	63⅝	61¼
Red brass	69⅛	66⅛
Comm. bronze	70⅞	67¾
Mang. bronze.....	62¼	60½
Free cutting rod ends.....	59	58

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire.....	69
No. 2 copper wire.....	59
Light copper.....	50

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire.....	65
No. 2 copper wire.....	55
Light copper.....	46
No. 1 composition	53
No. 1 comp. turnings.....	49
Hvy. yellow brass solids	36
Hvy. yellow brass turnings.....	27
Radiators.....	43

Aluminum

New mixed clips	34	—35
Old sheet.....	32	—33
Old cast.....	32	—33
Clean dry borings	33	—34

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings.....	27	—28
Mixed L.C. clips.....	24	—25
Old sheets and cast	19	—20
Borings and turnings.....	13	—14
Duraluminum clippings.....	22	—23

Copper and Brass

No. 1 copper wire.....	58	—59
No. 2 copper wire.....	51	—52
Light copper.....	44	—45
Radiators.....	37	—38
No. 1 composition	46	—47
No. 1 composition turn'gs.....	42	—44
Cocks and faucets.....	32	—33
Clean heavy yellow brass	31	—32
Brass Pipe	31	—32
New soft brass clippings.....	46	—47

Lead

Heavy soft lead.....	10	—11
Whole batteries.....	4	— 5
Type metal	15	—16
Electrotype.....	17	—18

Nickel

Nickel solids.....	95	—100
Nickel rod ends.....	95	—100
Nickel sheets, clips.....	95	—100
Nickel turnings.....	45	— 50

Zinc

New zinc clippings.....	15	—16
Old diecast zinc	9	—10

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EFFECTIVE MARCH 21, 1983

MATERIALS NEWSFRONT

(Effective March 21, 1983) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 77.00 to	$ 78.00
No. 2 hvy. melting	67.00 to	68.00
No. 1 dealer bundles	91.00 to	92.00
No. 1 factory bundles (auto)	91.00 to	92.00
No. 2 bundles	54.00 to	55.00
No. 1 busheling	91.00 to	92.00
Machine shop turn.	13.00 to	14.00
Shoveling turnings	34.00 to	35.00
Cast iron borings	33.00 to	34.00
Low phos. punchings plate	91.00 to	92.00
Heavy turnings	67.00 to	68.00
No. 1 RR hvy. melting	84.00 to	85.00
Rails 2 ft. and under	94.00 to	95.00
Scrap rails, random lgth.	87.50 to	88.50
RR specialties	83.00 to	84.00
No. 1 machinery cast	79.00 to	80.00
Cupola cast	72.00 to	73.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	550.00 to	560.00
18-8 turnings	450.00 to	460.00

Chicago

No. 1 hvy. melting	$ 77.00 to	$ 78.00
No. 2 hvy. melting	66.00 to	67.00
No. 1 dealer bundles	87.00 to	88.00
No. 1 factory bundles (auto)	93.00 to	94.00
No. 2 dealer bundles	54.00 to	55.00
No. 1 busheling	84.00 to	85.00
Shredder scrap	80.00 to	81.00
Machine shop turn.	14.00 to	15.00
Mixed bor. and turn.	15.00 to	16.00
Shoveling turnings	19.00 to	20.00
Cast iron borings	41.00 to	42.00
Low phos. forge crop	92.00 to	93.00
Low phos. punchings plate ¼ in. and heavier	98.00 to	99.00
Low phos. 2 ft. and under	92.00 to	93.00
No. 1 RR hvy. melting	84.00 to	85.00
Scrap rails, random lgth.	76.00 to	77.00
Reroller rails	101.00 to	102.00
Rails, 2 ft. and under	97.00 to	98.00
RR couplers and knuckles	86.00 to	87.00
RR car axles	109.00 to	110.00
No. 1 machinery cast	112.00 to	113.00
Cupola cast	97.00 to	98.00
Stove plate	94.00 to	95.00
Steel car wheels	86.00 to	87.00
Stainless		
18-8 bundles and solids	515.00 to	525.00
18-8 turnings	415.00 to	425.00
430 bundles and solids	130.00 to	135.00
430 turnings	95.00 to	100.00

Philadelphia

No. 1 hvy. melting	$ 62.00 to	$ 65.00
No. 2 hvy. melting	54.00 to	57.00
No. 1 dealer bundles	79.00 to	82.00
No. 2 dealer bundles	45.00 to	48.00
No. 1 busheling	79.00 to	82.00
Shredder scrap	77.00 to	80.00
Machine shop turn.	23.00 to	26.00
Mixed bor. and turn.	23.00 to	26.00
Shoveling turnings	40.00 to	43.00
Low phos. 5 ft. and under	79.00 to	82.00
Low phos. 2 ft. punchings	91.00 to	94.00
Electric furnace bundles	95.00 to	98.00
RR specialties	79.00 to	82.00
Rails, 2 ft. and under	93.00 to	96.00
Cupola cast	60.00 to	63.00
Heavy breakable cast	53.00 to	56.00
No. 1 machinery cast	97.00 to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 52.00 to	$ 53.00
No. 2 hvy. melting	50.00 to	51.00
No. 1 dealer bundles	76.00 to	77.00
No. 2 bundles	32.00 to	33.00
No. 1 busheling	73.00 to	74.00
Drop forge flashings	47.00 to	48.00
Machine shop turn.	29.00 to	30.00
Mixed borings and turn.	14.00 to	15.00
Shoveling turnings	29.00 to	30.00
Cast iron borings	13.00 to	14.00
Heavy breakable cast	32.00 to	33.00
Mixed cupola cast	48.00 to	49.00
Automobile cast	69.00 to	70.00
Stainless		
18-8 bundles and solids	430.00 to	440.00
18-8 turnings	310.00 to	320.00
430 bundles and solids	120.00 to	130.00

Youngstown

No. 1 hvy. melting	$ 67.00 to	$ 68.00
No. 2 hvy. melting	59.00 to	60.00
No. 1 dealer bundles	79.00 to	80.00
No. 2 dealer bundles	39.00 to	40.00
Machine shop turn.	2.00 to	3.00
Shoveling turnings	7.00 to	8.00
Low phos. plate	69.00 to	70.00
Electric furnace bundles	75.00 to	76.00
Galvanized bundles	65.00 to	66.00

Cleveland

No. 1 hvy. melting	$ 69.00 to	$ 70.00
No. 2 hvy. melting	29.00 to	30.00
No. 1 dealer bundles	77.00 to	78.00
No. 1 factory bundles	89.00 to	90.00
No. 2 bundles	24.00 to	25.00
No. 1 busheling	77.00 to	78.00
Machine shop turn.	2.00 to	3.00
Mixed bor. and turn.	2.00 to	3.00
Shoveling turnings	5.00 to	6.00
Cast iron borings	5.00 to	6.00
Cut structural & plates, 2 ft. and under	95.00 to	96.00
Low phos. punchings plate	95.00 to	96.00
Drop forge flashings	33.00 to	34.00
Foundry steel, 2 ft. & under	59.00 to	60.00
No. 1 RR hvy melting	63.00 to	64.00
Rails, 2 ft. and under	99.00 to	100.00
Rails, 18 in. and under	100.00 to	101.00
Steel axle turnings	69.00 to	70.00
Railroad cast	82.00 to	83.00
No. 1 machinery cast	89.00 to	90.00
Cupola cast	62.00 to	63.00
Stove plate	47.00 to	48.00
Stainless		
18-8 bundles	275.00 to	285.00
18-8 turnings	225.00 to	235.00
430 bundles	75.00 to	85.00

Buffalo

No. 1 hvy. melting	$ 33.00 to	$ 34.00
No. 2 hvy. melting	23.00 to	24.00
No. 1 busheling	38.00 to	39.00
No. 1 dealer bundles	36.00 to	38.00
No. 2 bundles	20.00 to	21.00
Machine shop turn.	9.00 to	10.00
Mixed bor. and turn.	16.00 to	17.00
Shoveling turnings	18.00 to	19.00
Cast iron borings	15.00 to	16.00
Low phos. plate	56.00 to	57.00
Structural and plate, 2 ft. and under	54.00 to	55.00
Rails, 2 ft. and under	50.00 to	51.00
Scrap rails, random lgth.	30.00 to	31.00
No. 1 machinery cast	71.00 to	72.00
No. 1 cupola cast	48.00 to	49.00

St. Louis

No. 1 hvy. melting	$ 64.00 to	$ 65.00
No. 2 hvy. melting	53.00 to	54.00
Foundry steel, 2 ft.	53.00 to	54.00
No. 1 dealer bundles	64.00 to	65.00
No. 2 bundles	50.00 to	51.00
Machine shop turn.	12.00 to	13.00
Shoveling turnings	18.00 to	19.00
Cast iron borings	30.00 to	31.00
No. 1 RR hvy. melting	64.00 to	65.00
Rails, random length	61.00 to	62.00
Rails, 18 in. and under	76.00 to	77.00
RR specialties	80.00 to	81.00
Cupola cast	70.00 to	71.00
Heavy breakable cast	48.00 to	49.00
Stove plate	82.00 to	83.00
Cast iron car wheels	49.00 to	50.00
Rerolling rails	96.00 to	97.00
Unstripped motor blocks	55.00 to	56.00

Birmingham

No. 1 heavy melting	$ 58.00 to	$ 59.00
No. 2 heavy melting	56.00 to	57.00
No. 1 dealer bundles	58.00 to	59.00
No. 2 bundles	43.00 to	44.00
No. 1 busheling	58.00 to	59.00
Shredder scrap	74.00 to	75.00
Machine shop. turn.	21.00 to	22.00
Shoveling turnings	31.00 to	32.00
Cast iron borings	31.00 to	32.00
Electric furnace bundles	58.00 to	59.00
Elec. furnace, 3 ft. & under	56.00 to	57.00
Structural and plate, 2 ft.	79.00 to	80.00
Structural and plate, 4 ft.	71.00 to	72.00
No. 1 RR hvy. melting	59.00 to	60.00
Scrap rails, random lgth.	60.00 to	61.00
Rails, 18 in. and under	79.00 to	80.00
Angles and splice bars	73.00 to	74.00
No. 1 cupola cast	77.00 to	78.00
Unstripped motor blocks	52.00 to	53.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 53.00 to	$ 54.00
No. 2 hvy. melting	52.00 to	53.00
No. 1 dealer bundles	59.00 to	60.00
No. 2 bundles	30.00 to	31.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	10.00 to	11.00
Cast iron borings	11.00 to	12.00
Low phos. 18 in. and under	78.00 to	79.00
Rails, random length	60.00 to	61.00
Rails, 2 ft. and under	82.00 to	83.00
No. 1 cupola cast	65.00 to	66.00
Heavy breakable cast	29.00 to	30.00
Drop broken cast	69.00 to	70.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 34.00 to	$ 35.00
No. 2 hvy. melting	30.00 to	32.00
No. 2 dealer bundles	22.00 to	23.00
Mixed bor. and turn.	7.00 to	8.00
Machine shop turn.	4.00 to	5.00
Shoveling turnings	10.00 to	12.00
Clean cast. chem. borings	34.00 to	35.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	38.00 to	39.00
Heavy breakable cast	14.00 to	15.00
Stainless		
18-8 prepared solids	455.00 to	475.00
18-8 turnings	340.00 to	365.00
430 prepared solids	70.00 to	80.00
410 solids	60.00 to	70.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 38.00 to	$ 40.00
No. 2 hvy. melting	28.00 to	30.00
No. 1 dealer bundles	40.00 to	42.00
No. 2 bundles	29.00 to	31.00
No. 1 busheling	40.00 to	42.00
Shredder scrap	43.00 to	45.00
Machine shop turn.	3.00 to	5.00
Shoveling turnings	7.00 to	9.00
No. 1 machinery cast	105.00 to	110.00
Mixed cupola cast	28.00 to	30.00
Heavy breakable cast	8.00 to	10.00

San Francisco

No. 1 hvy. melting	$ 41.00 to	$ 43.00
No. 2 hvy. melting	33.00 to	35.00
No. 1 dealer bundles	28.00 to	30.00
No. 2 dealer bundles	12.00 to	14.00
Machine shop turn.	4.00 to	6.00
Cast iron borings	4.00 to	6.00
No. 1 cupola cast	83.00 to	85.00

Los Angeles

No. 1 hvy. melting	$ 40.00 to	$ 42.00
No. 2 hvy. melting	29.00 to	31.00
No. 1 dealer bundles	27.00 to	29.00
No. 2 dealer bundles	9.00 to	11.00
Machine shop turn.	4.00 to	6.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	4.00 to	6.00
Elec. furnace, 1 ft. and under (foundry)	84.00 to	86.00
No. 1 cupola cast	86.00 to	88.00

Seattle

No. 1 hvy. melting	$ 58.00 to	$ 60.00
No. 2 hvy. melting	47.00 to	49.00
No. 2 bundles	36.00 to	38.00
No. 1 cupola cast	92.00 to	94.00
Mixed yard cast	79.00 to	81.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 43.00
No. 2 heavy melting cut 2 ft. and under	40.00
No. 1 dealer bundles	50.00
No. 2 bundles	20.00
Mixed steel scrap	24.00
Bush. new fact. prep'd.	48.00
Bush. new fact. unprp'd.	40.00
Machine shop turn.	23.00
Short steel turn.	26.00
Mixed bor. and turn.	15.00
Cast scrap	40.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 64.00 to	$ 65.00
No. 2 hvy. melting	49.00 to	50.00
No. 2 bundles	34.00 to	36.00
Machine shop turn.	18.00 to	19.00
Crushed turnings	33.00 to	35.00
Shredder scrap	64.00 to	65.00
Cut structural plate 2 ft. and under	84.00 to	86.00
Unstripped motor blocks	60.00 to	62.00
Cupola cast	69.00 to	71.00

BEST AVAILABLE COPY

STEEL PRICES

Codes identify Producers listed in the Key on page 73. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A. = Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest
W5 $366.00
N4 $366.00
West
C6 $346.00
Carbon Forging, East
B3(3), C10, U1 $453.00
R3 $453.00
Midwest
R3, U1, W5 $453.00
S1 $453.00
C10 $453.00
K2 $453.00
W5 $453.00
West
B3(2) $463.00
C6 $453.00
South
A7 $453.00
Alloy, East
R3, C10 $492.00
B3 $492.00
Midwest
W8, W5, C10 $492.00
S1, U1 $492.00
R3 $492.00
West
B3 $502.00
C6 $489.00
South
A7 $492.00

Piling Sheet Steel

(cents per lb)

Midwest
U1 26.45

Structurals

Carbon, East
B3(2) 23.90
U1, J3 23.90
Midwest
A7 24.15
C20 22.90
W8 22.90
I3, T10, U1, N4 23.90
West
C6 25.10
U1 24.40
B3(2) 21.65
South
C16, U1 23.90
T10 22.90
A8 Cmp*
High-Strength, Low Alloy, East
B3(2) 23.90
U1, J3 23.90
Midwest
N4 23.90
W8 24.15
U1 23.90
I3 23.90
West
U1, A7 24.40
B3(2) 21.65
South
U1, C16 23.90
Wide Flange, Carbon, East
B3 23.90
U1, A7, J3 23.90
Midwest
U1 23.90
N4 23.90
I3 23.90
West
U1 24.40
C6 24.15
South
A7 24.15

Strip

Hot-Rolled, Carbon, Cut ll Edge—all widths, East
B3, U1 22.05
J3 22.05
Midwest
A7, D1 22.05
I4 20.20
S1, J3, D1 22.05
W3 22.05
N4 22.55
W5 22.05
U1 22.05
B3, G2, I3, M2, R3, G3 22.05
West
K1 20.80
B3 24.70
South
R3 22.05
Cold-Rolled, Carbon Max. 25%, East
E4 29.75
R7, S10, B4 29.60
P15 24.80
S7 Cmp*
U1 35.30
D1(1) Cmp*
B4 31.55
Midwest
G4 24.80
I4 30.15
W14 22.95
S1, J4 34.05
T4 Cmp*
*Composite pricing
West
U1 33.25
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, (plus extras)
Midwest
M2, G3, R3, W3, I4, J3, G2, I3 22.05
A7 22.05
S1 22.05
West
K1 22.05
South
R3 22.05
High-Strength, Cold-Rolled, Low Alloy, Mill Edge, East
R7 29.00
Midwest
S1 32.00
Alloy, Hot-Rolled, Midwest (plus extras)*
S1 24.60
G4 25.80
I4 22.70
Alloy, Cold-Rolled, East
C11, E4, M8 43.35
R7 32.75
B4 42.60
P15 32.10
Midwest
I4 39.40
S1 42.30

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East
B3 22.05
J3 22.05
U1 22.05
Midwest
A7, U1, B3, G2, G3, I3, M2, R3, W3 22.05
S1, W5, D1 22.05
J3 22.05
I4 19.90†
West
U1 21.30
K1 22.05
South
R3 22.05
Cold-Rolled, East, Class I
B3(2), U1 26.15
J3 26.15
Midwest
B3, I3, G3, R3, M2, U1(2) 26.15
G2, W3, M11 26.15
I4 22.00
J3, A7 26.15
S1, W5, D1 26.15
West
U1 26.65
South
R3 24.65
Galvanized (hot-dipped), East
B3(2), U1 28.00
Midwest
J3, D1 28.00
I3, W5, S1 28.00
U1, A7, R3, Y1 28.00
G2, W3, M11 28.00
West
K1 27.15
U1 28.50
South
U1 28.00
R3 28.00
Enameling, Midwest
A7, I3, U1, J3 27.65
S1 26.50
Long-Terne, Midwest
W5 28.30
A7, U1 29.35
R3 29.35
†Actual weight basis

Wire Rod

East
B3(2) 22.35
U1 22.35
Midwest
N4 22.35
U1, K2 22.35
West
A7 22.00
C6 21.45
B3 23.25
South
G7 22.35

Tinplate

Electrolytic Tinplate
Single Reduced (70 lb)

East	per base box
B3, J3	$26.29
U1	26.29
Midwest	
B3	$26.29
U1	26.29
J3	26.29
M11	26.29
W3	26.29
W5	26.29
West	
K1	$26.79
U1	26.79
South	
U1	$26.29

Double Reduced (55 lb)**

Midwest	
M11 (50 lb)	$21.49
B3, J3	21.49
U1	21.49
W3	21.49
W5	21.49
West	
K1	$21.99
U1	21.99
South	
U1	$21.49

Black Plate
Single Reduced (75 lb)*

East	
B3	$24.01
Midwest	
J3	$24.01
M11	24.01
I3, U1, W5	24.01
W3	24.01
West	
K1	$24.01
U1	23.36

Double Reduced (55 lb)

East	
B3	$18.93
Midwest	
M11	$18.93
W5, U1	18.93
J3	18.93
W3	18.93
W5	18.93
West	
U1	$18.93
South	
U1	$18.93

*70 lb—base weight extra 45¢
**50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled
(Special quality)
East
R3, K3 25.80
R5 25.80
B3(3), J3 25.80
U1, C10 25.80
Midwest
A7 23.95
U1, I3, I4, C20, N4 25.80
R3, T10 25.80
K2 25.80
I3 19.50*
West
B3 25.80
C6 24.45
B3 24.70
South
A8 20.65
A7 25.80
C16 25.80
Cold-Finished Carbon, East
A11 22.15
R3 33.75
C21 21.15
J3(4), L2 31.00
C2 23.025
M8, W10, T11, S8 31.00
N1 24.475
R4 22.25
B4 31.00
M1 23.025
B4, C10 31.00
Midwest
B5, W10, Y1, W8, R3 33.25
J3 31.00
B1 19.80
L2 30.75
N9 31.00
P3 19.85 + CMS
W14 22.20
J3(3) 31.00
B5 31.25
J3 31.00
West
B5 31.20
B5 34.90
R3 37.15
South
B5 32.85
J3 34.00
C16 24.40
J3 31.95
Alloy, Hot-Rolled, East
B3(2), R5, K3, C10, U1 27.95
R3 27.95
J3 27.95
Midwest
A7, U1, R3 27.95
I3, C10 27.95
I4 24.85
I3 21.00*
West
B3 27.95
B5 18.50
C6 26.60
B3 27.10
South
A7 24.85
A8 22.00
Alloy, Cold Drawn, East
L2 35.20
R3, N1, C2 37.90
M1 28.025
R4 25.65
A11 30.50
J3, W10, L2 34.85
T11, S8 34.85
C10 34.85
J3(2) 34.25
Midwest
B5, R3, C10 37.35
C2 28.275
J3, M9, W10 34.85
P3 22.75
B1 22.70
N9 34.85
L2 34.65
B5 35.10
J3 36.00
J3 34.85
West
R3 40.75
B5 35.20
B5 38.25
South
J3 35.85
C16 28.00
B5 36.75

Plates

Carbon Steel, East
B3(2), U1 25.75
L4 25.75
P2 25.75
J3 26.75
Midwest
B3, S1 25.75
I3 25.75
J3, A7 22.80
U1, I4 25.75
R3 26.75
West
A7, B3, C6, O2 24.25
K1 23.50
U1 25.75
South
R3 25.75
A7 25.75
U1 25.75
Alloy, East
B3, J3 33.55
U1, L4 33.55
P2 33.55
J3 34.55
Midwest
B3 33.55
G2, G3 33.55
I4, U1 33.55
West
B3 33.55
O2 30.55
K1 31.30
South
A7 27.55

Wire

Carbon Steel Wire, East
B3(2) 27.10
U1 27.70
A11 22.15
Midwest
U1 27.70
A7, R3 24.60
N4, W7 27.40
K2 24.20
South
A8 22.85
West
A7 25.95
C6 24.95

STEEL PRICES

Producer Key
With Principal Offices

A4 American Cladmetals Co., Carnegie, Pa.
A7 Armco Inc., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A11 Atlantic Wire Co., Branford, Conn.

B1 Baron Drawn Steel Corp., Toledo, Ohio
B3 Bethlehem Steel Corp., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Steel Co., Harvey, Ill.

C1 Calstrip Corp., Los Angeles
C8 CF&I Steel Corp., Pueblo, Colo.
C10 Copperweld Steel Co., Warren, Ohio
C11 Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Co., Birmingham, Ala.
C20 Calumet Steel Div., Chicago Heights, Ill.
C21 Cumberland Steel Co., Cumberland, Md.

D1 Detroit Strip Div., Cyclops Corp.
D2 Driver Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.

E3 Enamel Products & Plating Co., McKeesport, Pa.
E4 Elliot Bros. Steel Co., New Castle, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.
G6 Gibraltar Steel Corp., Buffalo, N. Y.
G7 Georgetown Steel Corp., Georgetown, S. C.
G8 Guterl Special Steel Corp.

H1 Hercules Drawn Steel Corp., Livonia, Mich.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Steel Corp., Chicago

J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif
K2 Keystone Consolidated Industries, Inc.
K3 Kentucky Electric Steel Co., Ashland, Kentucky
K5 Kemco Div., Foote Mineral Co., Keokuk, Iowa

L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
L5 Litho-Strip Corp., Chicago

M2 McLouth Steel Products Corp.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M8 Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M11 Midwest Steel Div., National Steel Corp., Portage, Ind.

N1 Northeast Precision Steel Co., Boston, Mass.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N8 Northwest Steel Rolling Mills, Seattle, Wash.
N9 Nelson Steel & Wire Co., Chicago, Ill.
N10 North Star Steel Co., Saint Paul, Minnesota

O2 Oregon Steel Mills, Portland, Ore.

P2 Phoenix Steel Corp., Claymont, Del.
P3 Wyckoff Steel Div., Plymouth, Mich.
P9 Pacific States Steel Co., Niles, Cal
P13 Penn Dixie Steel Corp., Kokomo, Ind.
P14 Pacific Tube Co., Los Angeles
P15 Philadelphia Steel and Wire Corp., Phila.

R3 Republic Steel Corp., Cleveland
R4 Ramco Steel Co., Buffalo, N. Y.
R5 Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S10 Seneca Steel Service, Buffalo, N. Y.
S16 Southern Precision Steel Co., Gulfport, Miss.

T4 Thomas Steel Strip Co., Warren, O.
T5 Timken Company, Steel Division, Canton, O.
T7 Texas Steel Co., Fort Worth, Tex.
T9 Triumph Electro Corp., Chicago, Ill.
T10 Tennessee Forging Steel Corp., Harriman, Tenn.
T11 Teledyne Columbia-Summerill, Carnegie, Pa.

U1 United States Steel Corp., Pittsburgh, Pa.

W3 Weirton Steel Division, National Steel Corp., Weirton, West Va.
W5 Wheeling-Pittsburgh Steel Corp.
W7 Wilson Steel & Wire Co., Chicago
W10 Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14 Whittaker Steel Strip Div., Detroit, Mich.

Steel Service Center Prices

Price, Dollars per 100 lb

Cities* / City Delivery Charge*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	22.25	27.91	31.51	31.86	24.27	26.45	17.89	32.91	42.10	52.60	69.58	73.19
Baltimore	32.25	24.49	32.76	34.74	26.83	31.13	22.17	36.44	55.85	59.91	67.79	76.32
Birmingham	22.27	28.05	32.24	31.99	24.06	26.26	17.99	33.40	49.31	68.90	68.16	74.43
Boston	23.43	28.25	31.93	44.27	37.43	37.68	21.80	47.75	57.60	60.56	68.49	75.74
Buffalo	27.75	34.41	36.35	43.01	35.20	32.46	18.26	45.85	54.11	55.64	62.09	70.72
Chicago	22.26	28.66	31.01	29.34	26.76	27.28	15.83	35.60	35.94	42.45	49.53	54.47
Cincinnati	23.88	29.74	32.95	33.30	25.91	29.26	16.14	35.37	35.17	40.90	46.23	51.50
Cleveland	28.85	32.41	34.98	32.65	27.78	31.36	17.55	39.97	38.36	48.08	53.89	59.83
Denver	32.69	38.65	38.66	42.32	36.91	38.18	22.79	49.35	56.13	65.40	72.50	81.22
Detroit	24.88	31.65	32.95	33.74	26.31	26.79	16.83	37.64	36.87	40.55	46.63	52.90
Houston	23.83	28.26	32.53	41.35	34.12	37.90	17.16	38.14	36.36	42.15	50.79	56.90
Kansas City	23.37	27.16	31.59	30.36	30.20	34.55	17.37	43.29	41.88	50.92	56.17	63.93
Los Angeles	30.02	38.03	39.14	45.66	37.13	38.95	33.49	50.38	62.24	72.33	77.74	89.22
Memphis	31.68	36.62	36.40	38.57	30.45	34.49	21.97	41.48	52.82	56.96	67.85	77.44
Milwaukee	22.92	29.30	31.79	31.10	28.50	29.20	15.71	36.06	36.86	47.20	52.71	59.02
New York	22.00	26.53	30.70	42.40	31.67	32.93	20.83	48.87	50.98	58.83	68.45	75.35
Philadelphia	29.67	35.27	37.96	45.73	32.21	33.85	22.93	46.36	50.66	58.71	67.13	74.37
Pittsburgh	24.35	28.58	32.34	41.36	33.32	28.10	26.00	43.90	48.95	59.86	66.19	72.84
Portland	32.04	37.16	41.51	33.10	34.82	38.20	53.64	56.85	61.00	64.10	66.10	....
San Francisco	29.27	35.77	39.71	45.05	38.70	39.18	31.92	51.14	62.56	71.65	77.93	86.10
Seattle	29.85	35.14	37.68	46.76	32.89	35.32	29.86	51.38	64.02	70.14	73.83	87.67
Spokane	21.08	30.56	33.56	35.69	35.18	25.16	20.32	41.00	42.02	45.30	....	58.32
St. Louis	25.80	30.08	33.47	36.51	29.30	32.55	19.08	41.07	43.13	51.08	58.11	63.64
St. Paul	23.43	27.76	32.10	35.20	29.31	32.38	16.87	43.07	39.20	48.63	51.53	60.75

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-2^{15}/$_{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅛" round; Cold drawn—1" round; Hot-rolled 4140—1⅛" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

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METALWORKING PRICE TRENDS

Price trend from soft to softer may be dead-ending

The leader in continuing price softness is energy goods.

In February, energy prices fell by 2.9 pct at the producer level. This was the third straight month of energy price deflation.

In January, these prices fell by 4.2 pct—a record for a month-to-month decline.

Prices of natural gas, however, rose 3.2 pct in February. But that is nothing new for gas prices.

Due largely to government price decontrol of new-gas prices, natural gas prices overall rose a staggering 20.7 pct last year.

In metalworking goods lines, prices of autos were up 1.5 pct on a seasonally adjusted basis. That, according to one auto industry analyst, was due to a combination of a swing to costly larger cars and a widespread boost in actual selling prices. The price boosts came as dealers marked up tags and sold more on the basis of reduced auto-finance interest charges.

In *Iron Age's* list of 22 key metalworking product lines, advances in February were led by electric motors, fluid power equipment, plumbing fixtures and metal containers. These price moves, it is widely felt, reflected stepped-up market demand as the recession seemingly came to an end.

Still in metalworking generally, producer prices were in a softening mode in February. Five product lines showed actual price declines during the month, and four showed no price moves at all.

The recent great shift in price trends is getting to be old hat for U.S. manufacturers, including metalworking. In the aftermath of the 1973-75 recession, producer finished goods prices fell from a 18.3 pct rise rate in 1974 to 3.7 pct in 1976.

This time around, prices have tumbled from 11.8 pct in 1980 to a February 1983 rate of about 3.1 pct.

"It's not the price cuts that hurt," says one metalworking executive. "It is the policy and process that produces the cuts that hurts."

This executive refers to money supply restraints that broke prices, but also led to huge worker layoffs and other disruptions in his, and other, companies.

Producers prices now seem 'settled in' at about the 3.0 pct to 3.5 pct annual rate level.

With business activity now improving, the days of plummeting price advances is probably at an end.

Latest Month Covered: February, 1983

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	375.2	+ 0.4	+ 3.7
Metal Forming Machine Tools	414.4	+ 0.3	+ 4.0
Agricultural Machinery & Equip.	322.5	+ 0.3	+ 5.9
Construction Machinery & Equip.	348.1	− 0.1	+ 3.0
Industrial Process Furnace & Ovens	356.9	0	+ 4.2
Industrial Material Handling Equip.	285.3	− 0.5	− 0.7
Pumps, Compressors & Allied Equip.	349.4	− 0.1	+ 1.2
Fluid Power Equip. (Dec. 1970 = 100)	251.4	+ 1.0	+ 4.4
Mechanical Power Transmission Equip.	314.2	+ 0.4	+ 1.0
Automobiles	218.9	0	+ 4.0
Motor Trucks—Light	275.5	+ 0.1	+ 8.9
Motor Trucks—Heavy	317.5	0	+ 6.8
Railroad Equipment	357.3	− 0.1	+ 3.3
Fabricated Metal Structural Products	302.5	− 0.3	− 0.5
Electric Motors	302.3	+ 1.2	+ 3.5
Valves (Metal, Ex-Fluid Power—Dec. 1982=100)	100.8	+ 0.5	NA
Ball & Roller Bearings	331.2	+ 0.1	+ 2.9
Cutting Tools & Accessories	272.8	+ 0.2	+ 1.6
Heating Equipment	240.8	+ 0.3	+ 3.3
Plumbing Fixtures & Brass Fittings	283.4	+ 1.0	+ 2.5
Metal Containers	330.3	+ 1.0	+ 1.3
Miscellaneous Metal Products	288.6	0	+ 3.6

Data based on U.S. Labor Dept.'s Producer Price Index